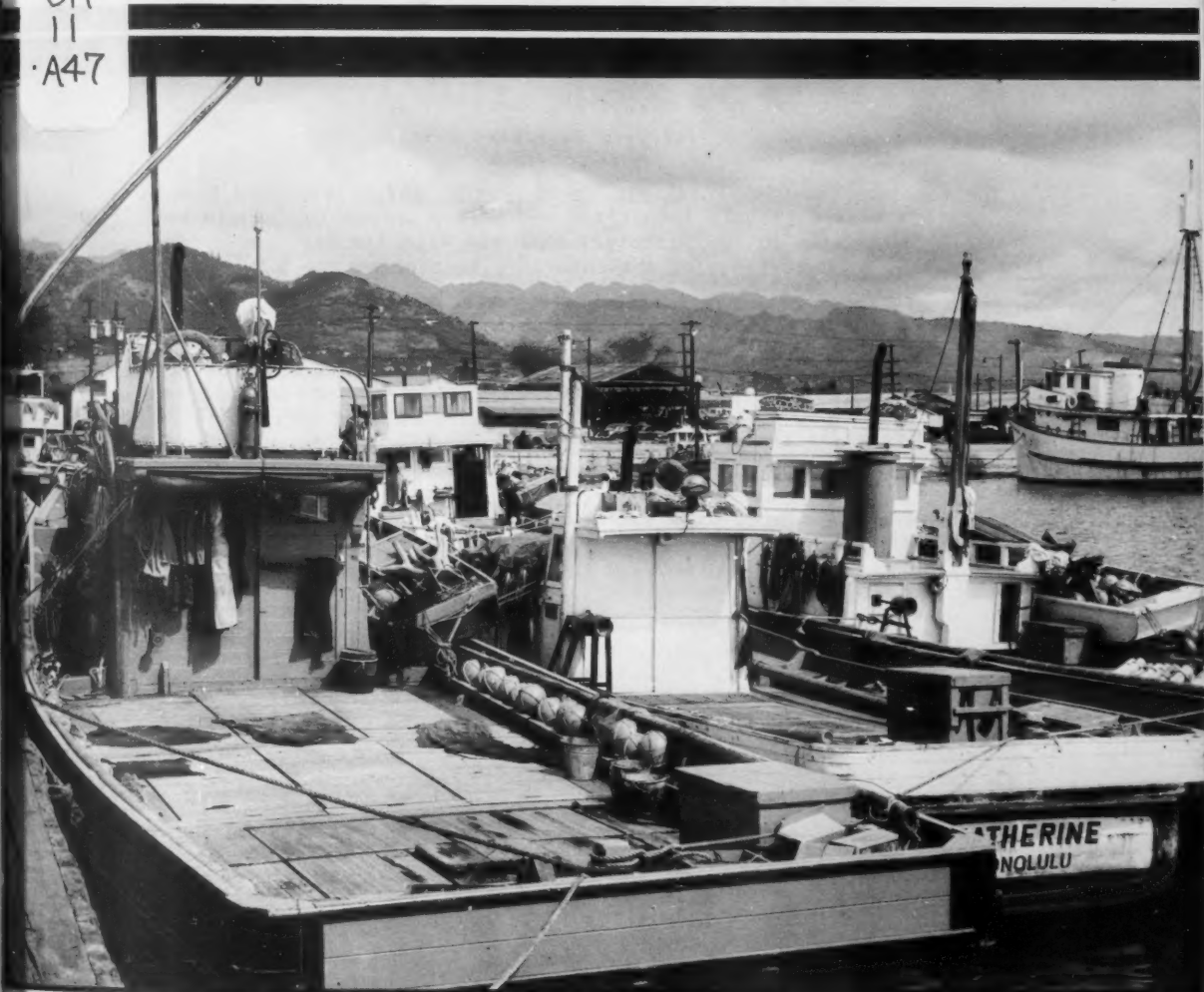


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FISH and WILDLIFE SERVICE

United States Department of the Interior

Washington, D.C.

UNITED STATES
DEPARTMENT OF THE INTERIOR
OSCAR L. CHAPMAN, Secretary

FISH AND WILDLIFE SERVICE
ALBERT M. DAY, Director



COMMERCIAL FISHERIES REVIEW



A REVIEW OF DEVELOPMENTS AND NEWS OF THE FISHERY INDUSTRIES
PREPARED IN THE BRANCH OF COMMERCIAL FISHERIES

A. W. Anderson, Editor

R. T. Whiteleather, Associate Editor

J. Pileggi, Assistant Editor

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JAPANESE TUNA-MOTHERSHIP EXPEDITIONS IN THE WESTERN EQUATORIAL PACIFIC OCEAN

(June 1950 to June 1951)

By Kenji Ego* and Tamio Otsu**

INTRODUCTION

The American fishing industry has watched with increasing interest the Japanese mothership-type fishing expeditions conducted in the waters of the Trust Territory of the Pacific Islands in the western Pacific. Much of the fish brought back from these expeditions has been exported to the United States as a finished canned product or frozen in the round for canning by American firms. Numerous questions regarding these expeditions have been directed to the Pacific Oceanic Fishery Investigations of the U. S. Fish and Wildlife Service, which has supplied the biological observers who accompanied most of these expeditions. This report will present the data available on the operations, catch, and proceeds of the first six expeditions, which were conducted from June 1950 to June 1951. It will supplement a previous report by Bell M. Shimada (1951) on the first expedition in which he gives many details of equipment, vessel construction, and operating techniques.

Statistical data on the catch, effort, and price received by each expedition were furnished by the Japanese Government through SCAP. Supplementing these data are the observations of U. S. Fish and Wildlife Service representatives who accompanied the first, third, fourth, and fifth expeditions.

All of these expeditions were organized and conducted in compliance with SCAP Directive No. 2097 issued on May 11, 1950, which authorized Japanese tuna-fishing vessels to extend their activities to certain areas in the vicinity of the Caroline, Mariana, and Marshall islands for the first time since the war.

The exacting terms and conditions under which the extension was granted and the areas of operation prescribed are stated in Weekly Summary No. 239 issued in May 1950 by the Natural Resources Section, GHQ, SCAP (1950). In brief, the directive provided that records of the fishing and fish catches must be kept, that a representative of the Supreme Commander for the Allied Powers (SCAP) accompany each expedition, that provision

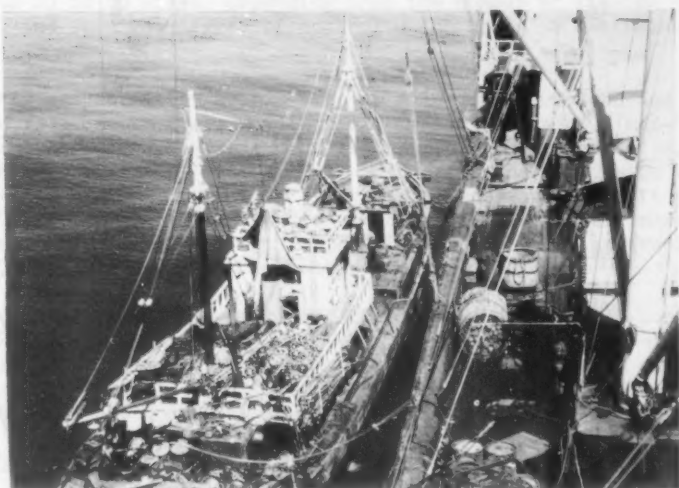


FIG. 1 - A JAPANESE TUNA CATCHER BOAT TIED UP TO A MOTHERSHIP.

* FISHERY METHODS AND EQUIPMENT SPECIALIST
** FISHERY RESEARCH BIOLOGIST

{ PACIFIC OCEANIC FISHERY INVESTIGATIONS,
U.S. FISH AND WILDLIFE SERVICE, HONOLULU, T.H.

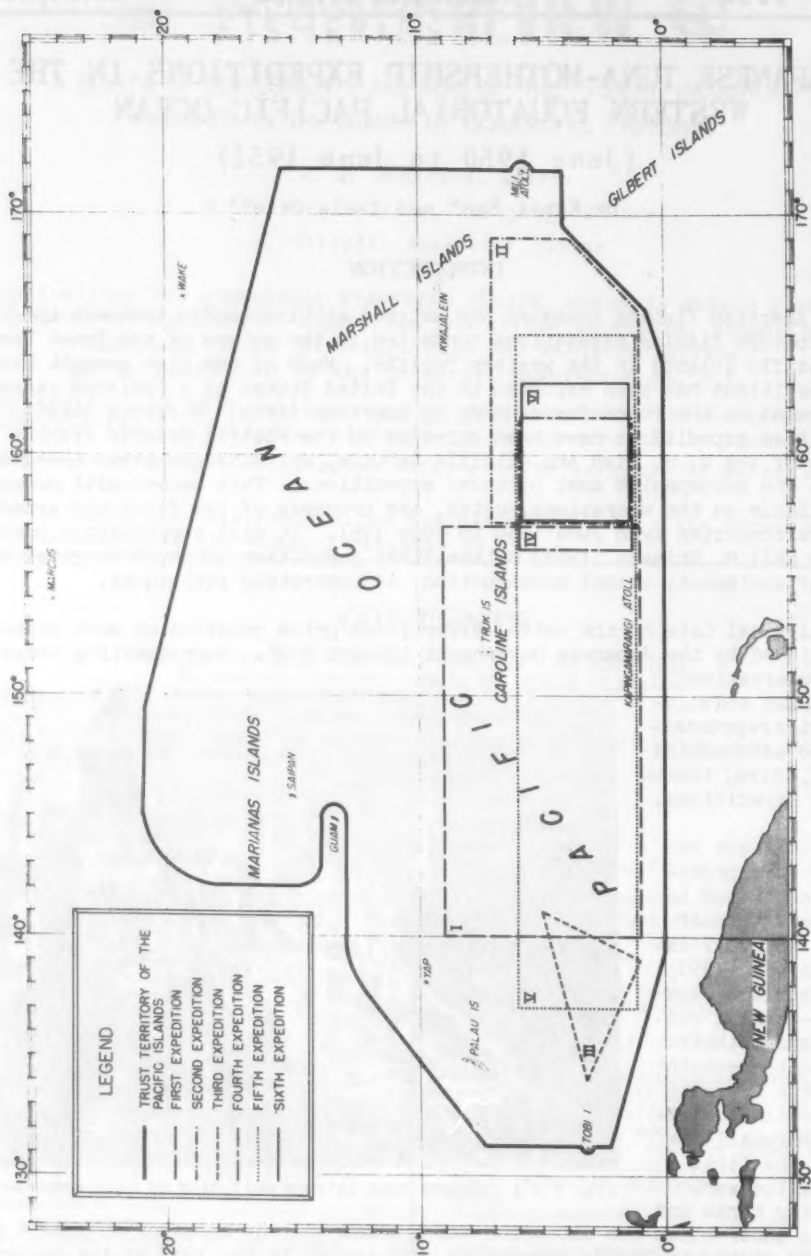


FIG. 2 - THE U.S. TRUST TERRITORY OF THE PACIFIC ISLANDS AND THE AREA FISHED BY EACH OF THE FIRST SIX JAPANESE MOTHERSHIP EXPEDITIONS FOR TUNA IN 1950 AND 1951. ALTHOUGH SOME OF THE EXPEDITIONS FISHED AS FAR NORTH AS 9° N. LATITUDE, MOST OF THE FISHING WAS DONE SOUTH OF 5° N. LATITUDE.

be made for a representative of the High Commissioner of the Trust Territory of the Pacific Islands and the U. S. Fish and Wildlife Service to board or accompany vessels of any expedition for purposes of observation and inspection, that daily radio reports be made of the positions of all vessels, that no vessel of the expedition approach closer than 3 miles to any land not under the administrative control of the Japanese Government, and that all operations be supervised by responsible Japanese officers.

The first six expeditions organized under this SCAP directive differed greatly in the scale of their operations. The Taiyo Fishing Company, Limited, one of the largest fishing concerns in Japan, owned the large whaling motherships Tenyo Maru No. 2 and Tenyo Maru No. 3, which were sent out on the first and fifth expeditions during the off-season for whaling. The second expedition, organized by the Hoko Suisan Company, chartered another large mothership, the Kaiko Maru, from the Nippon Suisan Company. These expeditions were in contrast with the third, fourth, and sixth expeditions organized by the Nansei Fisheries Co., Ltd., which used much smaller motherships. One was the large trawler Tenryu Maru, and another was a chartered auxiliary mothership, the Tosui Maru, which had been a coastwise carrier.

Almost all of the more than 20 million pounds of fish caught on these several expeditions was taken by long-line fishing. The details of the gear and method of operation in this type of fishing are given by Shimada (1951) and by Shapiro (1950) and need not be repeated here.

OPERATING RESTRICTIONS AND CONTROL

The SCAP representatives and the officers of the Japanese Fisheries Agency sought to insure compliance with the SCAP directives. All fishing vessels were ordered to keep a prescribed distance inside the boundaries of the authorized area. This distance ranged from 20 to 60 miles, depending upon the number of fishing vessels in an expedition and upon the degree of control which could be maintained over them.

Similarly, no fishing was permitted within 5 to 10 miles of any island and all fishing vessels were required to operate within a 200-mile radius of a mid-point, the latter being either the mothership or a stated geographical position. Vessels desiring to fish beyond the 200-mile radius could apply for permission to do so, the granting of which depended upon existing circumstances and was left to the discretion of the SCAP representative. By the use of radio direction finders aboard the mothership and the Japanese fishery inspection vessel, frequent checks of the fishing vessels' positions were made on each expedition.

To further insure maximum compliance with SCAP directives, daily radio contacts were maintained between the mothership and each fishing vessel at predetermined hours. The fishing vessels were required to transmit details of each day's activities, noon positions, direction in which the long lines were set, and estimates of their daily catches.

FISHING AREA AND PERIOD OF OPERATION

The extent of the grounds covered by an expedition varied from 300 to 1,700 miles in an east-west direction and from 240 to 500 miles in a north-south direction. Vast areas were traversed by the larger expeditions, which carried an adequate store of fuel and provisions, while the smaller expeditions with limited facilities fished in relatively small areas (table 1).

Details of the fishing area and period of operation for the first expedition have been given by Shimada (1951) and are summarized in table 1.

Expedition	Motherships		No. Catcher Vessels	Area Fished	Period Fished
	Name	Gross Tonnage (Metric tons)			
I	Tenyo Maru No. 2	10,619	25	10°-9°N. lat.; 140°-157°E. long.	June 17, 1950 - September 5, 1950
II	Kaiko Maru	2,940	13	10°-7°N. lat.; 157°-169°E. long.	July 20, 1950 - September 30, 1950
III	Tenryu Maru	577	6	10°-5°N. lat.; 134°-141°E. long.	December 1, 1950 - December 26, 1950
IV	Tenryu Maru Tosui Maru	577 362	11	10°-6°N. lat.; 156°- 161°30'E. long.	February 1, 1951 - February 24, 1951
V	Tenyo Maru No. 3 Banshu Maru No. 35	3,689 999	16	10°-6°N. lat.; 137°-165°E. long.	March 21, 1951 - June 13, 1951
VI	Tenryu Maru Tosui Maru	577 362	8	10°-6°N. lat.; 157°-163°E. long.	April 22, 1951 - May 25, 1951

The 13 catchers of the second expedition fished in an area bounded by 10°00' and 7°00' N. latitude and 157°00' and 169°00' E. longitude. Fishing began on July 20 and ended on September 30, 1950.

During the third expedition, which was accompanied by the senior author, fishing operations were confined within a triangle having points at 3°10' N. latitude, 134°00' E. longitude; 1°00' N. latitude, 139°00' E. longitude; and 5°00' N. latitude, 141°00' E. longitude. The first catcher commenced fishing on December 1, while the sixth and last catcher vessel to arrive on the fishing grounds began operation on December 15, 1950. The first fishing vessel which caught a full load of fish after having unloaded a prescribed amount to the mothership, departed for Japan on December 20. On December 26 fishing was terminated and all vessels still present on the fishing grounds proceeded to their home ports.

The area covered during the fourth expedition (also accompanied by the senior author) was bounded by 10°00' and 6°00' N. latitude and by 156°00' and 161°30' E. longitude. Operations were begun on February 1, 1951, and by February 8 the eleven fishing vessels and the two portable catcher boats comprising the entire fishing potential of the expedition were actively fishing. On February 16 the first catcher vessel departed for Japan. On February 24 all fishing activities were officially concluded and all vessels present on the fishing ground proceeded to Japan.

Fishing activities of the fifth expedition (accompanied by the junior author) were first conducted in an area of 200-mile radius with the midpoint at 4°00' N. latitude and 140°00' E. longitude. The general plan of operation was to start here and gradually move eastward as a unit, thereby covering as wide an area of the equatorial countercurrent region as possible. The speed of this eastward movement depended largely on the results shown by catcher vessels along the way. The expedition fished as far east as the 165th meridian and between 1°00' and 6°00' N. latitude. The first two catchers to arrive on the fishing grounds commenced fishing on March 21, 1951, and the entire fleet of 15 boats was in operation by April 12. Fishing was terminated on June 13.

The fleet of the sixth expedition arrived on the fishing grounds while the fifth was in the midst of operation. Since it was not accompanied by a SCAP representative, the sixth expedition was attached to the fifth for administrative

control. It fished between April 22 and May 25, 1951, in an area adjacent to the fleet of the fifth expedition.

FLEET COMPOSITION

The vessels utilized as motherships in these expeditions ranged in size from the 577-ton Tenryu Maru to the 10,000-ton Tenyo Maru No. 2. Correspondingly, the number of catcher vessels in the fleets varied from 6 to 25, with the larger fleets accompanying the larger motherships. The Taiyo Fishing Company, as one of the largest and most active fishing concerns in postwar Japan, had the necessary resources and facilities to engage in the more elaborate operations. The company was able to redeploy its large refrigerated carrier ships, which are normally used in the Antarctic whaling expeditions, to tuna fishing activities during the slack whaling seasons.

On the other hand, the Nansei Fisheries Company is primarily a trawl fishing concern. The major trawling grounds located in the East China Sea and most of the other grounds formerly exploited by the company have been closed to Japanese fishing since the war. The grounds still open to Japanese trawling have been exploited to such an extent that trawling operations in those waters have become barely profitable. Consequently, when the opportunity arose to engage in the tuna-fishing industry, this fishing company, though poorly equipped for such an undertaking, focused its attention in that direction. Its expeditions have been small in scale and of short duration.

Complete data on the fleets are available only for the expeditions which were accompanied by an observer. Hence the following discussion will briefly describe the composition of the third, fourth, and fifth expeditions, of which the first two were operated by the Nansei Fisheries Company and the last by the Taiyo Fishing Company.

The Tenryu Maru, a steel trawler of 577 gross tons with an over-all length of 176 feet, a beam of 26.9 feet, and a molded draft of 14.8 feet, was used as the mothership for the third and fourth expeditions. She is powered with a six-cylinder Diesel engine of 510 hp. In converting the Tenryu Maru from a trawler to a tuna-fishing mothership, no major changes were made. The only addition was the installation of a pair of boat davits against the starboard bulwark of the forward well deck for the hoisting and lowering of the two portable catcher boats which were transported to and from the fishing grounds on the fourth expedition. On the third expedition the total complement of men aboard the mothership numbered 37, while on the fourth expedition there were 58 men aboard.

The task of organizing and conducting the third and fourth expeditions was undertaken by the Nansei Fisheries Company, Ltd. Of the vessels participating in the third expedition, the Tenryu Maru was the only one owned and operated by the fishing company. All six catcher vessels in the third expedition were independently owned and operated.

In addition to the Tenryu Maru, the Tosui Maru, which was chartered from the Totsu Fisheries Corporation by the Nansei Fisheries Company, was used as an auxiliary mothership for the fourth expedition. The Tosui Maru, a 362-gross-ton vessel with an over-all length of 150.3 feet, a beam of 24.3 feet, and a draft of 13.8 feet, was primarily designed and normally operated as a coastwise carrier. The carrying capacity of the vessel is estimated at 125 metric tons of iced fish. The total number of men aboard the auxiliary mothership was 22.

Of the 11 catchers participating in the fourth expedition, 3 belonged to prefectural fisheries experiment stations, 1 belonged to the Nansei Fisheries Company, and the rest were owned by other fishing companies. Two of the prefectural vessels carried regular crews of professional fishermen while the third carried 25 students from the Yaizu Fishery College, in addition to a crew of experienced commercial fishermen.

On the fourth expedition, two portable catcher boats of 5 gross tons each, 27.9 feet in length, and 7.7 feet in beam, were transported to and from the fishing grounds aboard the Tenryu Maru. These portable boats were constructed of wood and powered with hot-bulb engines of 15 hp.

With the exception of the portable catcher boats, all vessels participating in the third and fourth expeditions were constructed of steel and were powered with 4-cycle Diesel engines. The fishing vessels were either specially designed long-line vessels or were combination skipjack (live-bait) and long-line vessels. A detailed description of a typical long-line vessel is given by Shimada (1951). Lists of boats and further particulars of the vessels in these expeditions are given in table 2.

Table 2 - Particulars of Catcher Vessels in the Third, Fourth, and Fifth Japanese Tuna-Mothership Expeditions

Name of Vessel	Gross Tonnage (Metric tons)	Main Engine hp.	Construction	Date of Construction	Number in crew	Name of Vessel	Gross Tonnage (Metric tons)	Main Engine hp.	Construction	Date of Construction	Number in crew
THIRD EXPEDITION:						FIFTH EXPEDITION:					
Asuma No. 11	144	320	steel	1947	23	Asahi	60	210	wood	1947	18
Gohoku No. 1	148	320	"	1948	24	Asahi No. 7	84	140	"	-	16
Seiyo No. 3	153	350	"	-	-	Asahi No. 12	97	160	"	-	18
Selaho No. 1	179	380	"	1949	30	Asuma No. 1	138	320	steel	-	24
Shinko No. 30	190	290	"	-	-	Asuma No. 2	139	320	"	1947	24
Taihei	146	300	"	1947	25	Asuma No. 3	147	320	"	1947	25
FOURTH EXPEDITION:						Asuma No. 5	146	320	"	1947	25
Asahi	145	250	"	1947	28	Asuma No. 7	145	320	"	1947	24
Chyokyo	196	400	"	1946	34	Euroshio No. 10	170	250	"	-	24
Fuji	191	380	"	1950	1/51	Hankai No. 2	76	160	wood	-	18
Haikutsu	131	320	"	1946	24	Sasayama No. 7	158	320	steel	-	23
Nikko No. 11	146	350	"	1948	31	Seiyo No. 3	153	250	"	-	24
Ruson	100	210	"	1932	22	Seiyo No. 7	153	250	"	-	24
Saganai	167	380	"	1949	26	Tairyo No. 23	56	115	"	-	17
Selaho No. 1	179	380	"	1949	29	Tairyo No. 31	56	160	"	-	16
Seiyo No. 2	144	290	"	1946	25	Tairyo No. 38	56	115	"	-	18
Shiratori	158	400	"	1948	25						
Taihei	146	300	"	1947	22						

1/ A FISHERIES TRAINING VESSEL WITH 25 STUDENTS IN ADDITION TO THE REGULAR CREW.

The mothership of the fifth expedition, the Tenyo Maru No. 3, of 3,689 gross tons and 2,868 net tons, with a length between perpendiculars of 327 feet, a molded beam of 49 feet, and a molded draft of 26 feet, was powered by a 2,250-hp. main Diesel engine, two 450-hp. and one 100-hp. auxiliary Diesel engines. Three 50-ton freezing machines operated its refrigeration system. Personnel numbered 142 men.

An auxiliary refrigerated carrier, the Banshu Maru No. 35, arrived on the fishing grounds on April 21, 1951, to transport approximately 500 metric tons of frozen fish back to Japan. This vessel delivered fresh provisions in addition to fuel and ice, and relieved the mothership of the task of providing catcher vessels with crushed ice, until her departure on May 16.

The fifth expedition started out with fifteen catcher vessels ranging in size from 55 to 170 gross tons; later in the season another vessel joined the fleet. However, in mid-season, a 55-ton steel catcher, the Tairyo Maru No. 38, ran aground on a reef during a storm at Kapingamarangi Atoll (19°05' N. latitude-154°48' E. longitude) and had to be abandoned. The expedition suffered a second mishap on June 14, 1951, when a 145-ton catcher, the Azuma Maru No. 7, struck a reef south of Truk (7°06' N. latitude-151°55' E. longitude) while proceeding to Japan. This vessel, too, had to be abandoned although a large part of the fishing gear and other removable equipment was salvaged.

With the exception of the Kuroshio Maru No. 10, which belonged to the Nichiro Fisheries Company, all of the 16 catcher vessels participating in this expedition belonged to the Taiyo Fishing Company. Four catcher vessels in the 55- to 85-gross-ton class were of wooden construction, all others being of steel.

MOTHERSHIP'S RELATION TO THE EXPEDITION

Since maximum compliance with SCAP directives can be maintained most effectively aboard a central control vessel capable of housing the necessary supervisory personnel and equipped with a radio direction finder and a communication system powerful enough to contact the home port as well as each vessel in the fleet, authorization to fish in the U. S. Trust Territory has been given only to fleets accompanied by suitable motherships. Any vessel meeting SCAP specifications was permitted to serve as a mothership.

The size of the vessel determined to a large degree the extent of operations possible for the fleet of the expedition. A small mothership with its limited facilities was unable to support a fleet for any extended period, while a large mothership was able to serve as a supply and storage center for its fleet over a longer period.

The small mothership Tenryu Maru was found to be adequate for purposes of control; however, in a logistic sense it left much to be desired. The ship could supply only very small quantities of fuel, ice, water, and food to the catcher vessels. Consequently, all catchers participating in the third and fourth expeditions were forced to be nearly self-sufficient.

A water-evaporating apparatus was not installed aboard the mothership and, since the capacity of the water tanks was only 70 metric tons, no fresh water was supplied the catcher vessels. With strict rationing, about 50 tons of freshwater were consumed aboard the mothership on each of the two expeditions.

The capacities of the fuel tanks aboard the mothership totaled 141 metric tons. On the third expedition, 45 tons of Diesel oil were used by the mothership and 9 tons were sold to the catchers; while on the fourth, 82 tons were used by the mothership and 40 tons were sold to the catchers.

Two holds located below the forward well deck were used for ice en route to the fishing grounds, and subsequently for fish. Most of the 120 tons of ice was used by the mothership for packing fish, although a few tons were sold to the catchers. The total fish-carrying capacity of the holds was estimated at 175 metric tons.

The Tenyo Maru No. 3 of the fifth expedition, with its relatively large deck space and the refrigeration facilities necessary in the processing and transporting of whale meat, was found to be quite satisfactory in its new role as mothership of a tuna expedition. The fleet worked as a closely-knit unit, with the catcher vessels necessarily dependent upon the mothership for their supply of fuel, bait, water, ice, and provisions in such an extended operation. The three refrigerated storage holds of the mothership had an estimated capacity of more than 1,000 metric tons of frozen fish. The 947 tons of fresh water carried to the fishing grounds and the additional 500 tons produced by distillation were sufficient for an expedition of this size. Catcher ships' water tanks, ranging from 3 to 10-ton capacity, were supplied with fresh water throughout the expedition. Upon leaving Japan, the cargo holds were loaded with 891 tons of ice in 200-pound blocks. With the delivery of an additional 366 tons by the Banshu Maru No. 35 in mid-season, 1,257 tons of ice were utilized by the 16 catcher vessels in the 85 days of

fishing. The catcher vessels and the inspection vessel were supplied with approximately 415 tons of Diesel oil, while the fuel consumption by the mothership amounted to approximately 590 tons during the 108 days at sea. The fuel-tank capacity of the mothership was approximately 1,250 tons.

WORKING AGREEMENT

On the third and fourth expeditions the Nansei Fisheries Company supplied the mothership and made the following agreement with the independently-owned catcher vessels:

- (a) "Each catcher vessel will deliver a minimum of 2,500 kan (20,668 lbs.) of fish in prime condition to the mothership while on the fishing ground.
- (b) "In the event that delivery of the allocated amount of fish is not feasible due to accidents or unavoidable difficulties, the owner of the catcher vessel will pay the Nansei Fisheries Company, Ltd., an amount of money corresponding to the allocated amount of fish. This reimbursement will be made after the vessel's return to Japan and will be based on the average ratio of delivery made by the rest of the vessels in the fleet.
- (c) "Should the catcher vessel fail to realize any catch or should the catch be comparatively small, the Nansei Fisheries Company, Ltd., and the owner of the catcher vessel will negotiate for an equitable adjustment upon the return of the vessels to Japan.
- (d) "Of the amount allocated, sharks will not comprise more than 10 percent of the total load of fish delivered to the mothership.
- (e) "Regardless of fish species, the purchase price of the minimal delivery of 2,500 kan of fish will be 100 yen per kan (3.4 cents per pound).
- (f) "Upon delivery of more than 2,500 kan of fish, price adjustments, mutually satisfactory to both parties concerned, will be made between the general manager of the mothership and the captain of the catcher vessel.
- (g) "The mothership will supply 5 tons of fuel oil per boat at the original price.
- (h) "In the event that unforeseen complications arise, negotiations and adjustments will be made by the fishing company and the catcher ship owner in the presence of a representative from the Fishery Agency."

The Taiyo Fishing Company, Ltd., which owned and operated most of the vessels in the fifth expedition, drew up the following contract with the fishermen:

- (a) "The fishermen of a catcher vessel to be reimbursed with 40 percent of the profit derived by that vessel after deducting trip expenses from the total proceeds realized.
- (b) "The boat owner to receive the remaining 60 percent.
- (c) "A minimum guarantee of 8,000-15,000 yen (US \$22.00-\$42.00) per month will be made to the individual fisherman, the amount depending upon his experience and rank.
- (d) "The top prices to be paid by the mothership for the different species of fish will be:

Species	Cents Per Pound ^{1/}
Yellowfin tuna	7.0
Spearfishes, big-eyed tuna, albacore	5.4
Wahoo	5.0
Skipjack tuna	4.4
Barracuda, others	2.7
Sharks	2.0

^{1/} YEN PER KAN WERE CONVERTED TO CENTS PER POUND BY USING THE CONVERSION FACTORS OF 1 KAN = 8.267 POUNDS AND 360 YEN = \$1.00.

"At the mothership each fish will be classified into a grade according to its condition. Prices will differ for the different grades of fish."

FISHING METHODS

Unlike the first expedition, where the long-line method of fishing was augmented by pole-and-line fishing for surface schools of fish, only the long-line was used in the other expeditions. This is a drifting long-line designed to fish at subsurface levels for tunas, spearfishes, and other large pelagic fish. The main line is suspended at 150- to 175-fathom intervals with 9- to 17-fathom float lines attached to glass floats 9 to 12 inches in diameter. Between floats, 5 to 6 dropper lines of 8 to 11 fathoms in length are hung from the main line at equal intervals. The hooks are usually baited with frozen sauries (*Cololabis saira*) or sardines (*Sardinia melanosticta*). In one day's fishing a catcher vessel of the

130-ton class may set 300 to 350 baskets in one continuous connected line with 1,600 to 1,800 hooks.

For further particulars on the long-line gear, refer to Shapiro's (1950) report on the Japanese long-line fishery and Shimada's (1951) account of the first mothership-type tuna expedition. The developmental history of the long-line and details of the construction and use of the gear are given by Shapiro. Shimada describes in full the construction of the gear and the technique of setting and retrieving the gear as well as other operational aspects of a typical long-line vessel.

FISH CATCH

The catch composition by species was similar for all six expeditions. The tunas included the yellowfin tuna (*Neothunnus macropterus*), big-eyed tuna (*Parathunnus sibi*), albacore (*Thunnus germon*), oceanic skipjack (*Katsuwonus pelamis*), and an occasional black tuna (*Thunnus orientalis*). Of the spearfishes caught, the species included the black marlin (*Makaira mazara*), white marlin (*Makaira marlina*), striped marlin (*Makaira mitsukurii*), sailfish (*Istiophorus orientalis*), short-nosed spearfish (*Tetrapterus brevirostris*), and broadbill swordfish (*Xiphias gladius*). The miscellaneous varieties of fish which constituted a small percentage of the catch consisted of the barracuda (*Sphyræna sp.*), wahoo (*Acanthocybium solandri*), and the dolphin (*Coryphaena hippurus*). Among sharks included in the catch were the mackerel shark, the hammerhead shark, the great blue shark, the thresher shark, and another fairly common species known by the Japanese as the *hiragashira*, probably belonging to the genus *Scoliodon*.

Yellowfin tuna was the species sought and found to be abundant in the waters of the Trust Territory. In each of the six expeditions this species constituted the major portion of the total catch, amounting to about 60 percent of the total by weight.

The big-eyed tuna also was an important constituent of the catch, being second to yellowfin among the tunas caught. This species averaged a little over 10 percent, both by weight and number, of the total catches made during the six expeditions.

Among the spearfishes, the black marlin was predominant and was next to the yellowfin tuna in number and weight. Further details of the catch composition by

Table 3 - Japanese Tuna-Mothership Expeditions—Total Catch and Average Weights (in pounds) by Species

Species	E X P E D I T I O N S											
	First		Second		Third		Fourth		Fifth		Sixth	
	Total	Avg.	Total	Avg.	Total	Avg.	Total	Avg.	Total	Avg.	Total	Avg.
Yellowfin tuna	4,572,698	75	3,246,486	101	395,889	67	805,609	78	2,362,692	74	710,739	75
Big-eyed tuna	698,761	80	396,913	98	58,279	90	138,979	96	863,066	86	158,597	98
Albacore	65,355	45	24,223	48	8,027	42	10,015	46	11,706	48	888	36
Black tuna	3,428	343	-	-	-	-	-	-	727	364	-	-
Skipjack tuna	6,966	8	16,671	12	1,234	9	502	7	835	10	2,540	7
Black marlin	1,759,751	131	1,447,517	149	72,609	117	295,098	132	658,987	131	211,412	125
White marlin	48,164	171	2,486	166	5,493	172	7,966	150	20,932	146	2,273	126
Sailfish	28,150	44	11,901	32	3,156	40	8,605	37	35,002	37	10,818	39
Swordfish	13,651	76	6,308	91	3,656	58	2,363	98	11,640	85	3,576	102
Striped marlin	1,228	123	1,605	123	190	80	231	116	521	87	370	123
Sharks	894,698	56	402,518	72	37,025	94	28,917	73	385,738	66	41,746	69
Others ^{2/}	23,045	28	21,298	29	4,095	18	12,234	23	23,396	19	16,604	23
Total	8,115,895		6,577,926		589,653		1,310,519		4,375,244		1,159,563	

^{1/} INCLUDES SHORT-NOSED SPEARFISH (*TETRAPTERUS BREVIROSTRIS*).

^{2/} INCLUDES MISCELLANEOUS SPECIES, SUCH AS WAHOO, DOLPHIN, AND BARRACUDA.

species are found in table 3. Also included in table 3 are the average weights, by expeditions, of the various species of fish caught.

VARIATIONS IN FISHING SUCCESS

From the data obtained in the prewar Japanese surveys of the waters of their former Mandated Islands (present Trust Territory), Nakamura (1943) reported a catch per 100 hooks per day of 6.05 tunas and marlins from the area between 0° and 5° N. latitude and 130° and 180° E. longitude. For the same period, he reported 1.70 tunas and marlins caught per 100 hooks from waters north of 5° N. latitude. Yellowfin tuna was found to be most abundant in the catch followed by the black marlin and the big-eyed tuna. Nakamura has concluded that, in general, the yellowfin tuna is most abundant in the equatorial countercurrent and particularly south of 5° N. latitude.

The postwar tuna expeditions, while fishing north to 9° N. latitude, have confined most of their fishing activities to the south of 5°. The results obtained did not vary greatly from one expedition to the other, the average for all six

Table 4 - Catch Rates of Japanese Tuna-Mothership Expeditions

Species	NUMBER OF FISH CAUGHT PER 100 HOOKS PER DAY FISHED					
	E X P E D I T I O N					
	First	Second	Third	Fourth	Fifth	Sixth
Yellowfin tuna	2.28	2.50	3.38	2.71	2.24	2.49
Big-eyed tuna	0.33	0.32	0.37	0.38	0.70	0.43
Albacore	0.05	0.04	0.11	0.06	0.02	<0.01
Black tuna	<0.01	-	-	-	<0.01	-
Skipjack tuna	0.03	0.11	0.08	0.02	<0.01	0.09
Black marlin	0.50	0.76	0.36	0.59	0.35	0.45
White marlin	0.01	0.01	0.02	0.01	0.01	<0.01
Sailfish and Shortnosed spearfish	0.02	0.03	0.04	0.06	0.07	0.07
Broadbill swordfish	<0.01	0.01	0.04	0.01	0.01	<0.01
Striped marlin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sharks	0.60	0.44	0.23	0.10	0.41	0.16
Others	0.03	0.06	0.13	0.14	0.08	0.19
Tunas and marlins	3.23	3.77	4.40	3.84	3.40	3.55
Total	3.85	4.27	4.76	4.08	3.89	3.89
< LESS THAN						

being 3.70 tunas and marlins caught per 100 hooks. The fourth expedition achieved the highest ratio of 4.40 while the first recorded the lowest of 3.23. Table 4 lists the catch per 100 hooks for the different species in each of the expeditions.

Without knowing whether the prewar Japanese data are exactly comparable, it is probable that the catches of the present expeditions are at a comparatively low level. It must be realized that this fishery was not exploited during World War II, a situation in which one would normally expect an increase in catch in the period immediately following. This difference between the two periods was noticed by the Japanese fishermen, who attributed it to a decrease in the abundance of the tuna stocks (Shimada 1951).

UNLOADING

During the third and fourth expeditions most of the fishing vessels unloaded only the minimum quantity of 2,500 kan (20,600 pounds) of fish that was stipulated in the agreement. In view of the fact that fish landed during the earliest part of the expedition would be fish stored for the longest period of time, and thus

presumably in the poorest condition when brought back to Japan, the fishing vessels tended to discharge their catches aboard the mothership as soon as 2,500 kan of fish were caught. Since the catchers did not arrive on the fishing grounds and begin fishing on the same date, the first deliveries were reasonably well spaced so that the mothership was able to handle them without delay. A strict unloading schedule for each catcher was found to be unnecessary. The fishing vessel desiring to discharge her catch contacted the mothership by radio and made arrangements for a rendezvous. Whenever possible, the mothership ran half the distance to the catcher vessel.

In the fifth expedition, with the exception of a few tons of fish caught during the last days of the operation, the entire landings made by the fishing vessels were transferred to the mothership. Since there were only 15 active catcher vessels, the processing of one or two vessels per day sufficed and resulted in a smooth unloading operation. A flexible schedule maintained by the mothership often permitted the catcher vessels to change the unloading date to the most suitable day. Usually a fishing vessel unloaded her catch after 8 to 10 days of active fishing.

Unlike the motherships of previous expeditions, the Tenyo Maru No. 2 of the fifth expedition was given a greater de-

gree of freedom in its movements, since it was not required to serve as the mid-point of catcher-ship operation. As a result of this change, the mothership was often able to make a run to the catcher vessel desiring to unload her fish. This arrangement saved many hours of valuable fishing time for the fishermen. The 16 catcher vessels present in the fifth expedition seemed to be the optimum number that a mothership of around 3,000 tons could efficiently handle on an extended fishing trip. Enough fish was received daily to keep the refrigeration facilities in constant operation. The processing crew aboard the mothership were kept occupied throughout the day, but they generally received sufficient hours of rest so that high morale was maintained.



FIG. 3 - YELLOWFIN TUNA ABOUT TO BE TRANSFERRED TO A JAPANESE TUNA MOTHERSHIP.

On all expeditions the transfer of fish and supplies was made out in the open sea. Fortunately, wind forces from dead calm to gentle breeze predominated throughout the operations in the lower latitudes. In taking fishing vessels alongside, the mothership of every expedition drifted with the prevailing wind and swell broad on the beam. The catcher vessel came in from aft along the lee of the mothership. Bow and stern lines, usually in conjunction with spring lines, were used to secure the catcher alongside the mothership in position to unload with the forward well deck of the catcher abreast of the processing deck of the mothership.

In the expeditions using motherships of 3,000 tons or larger, the mooring operation presented no great problem. However, during the third, fourth, and sixth expeditions, in which a mothership of 577 gross tons was used, the difficulties entailed in providing safe moorage for the catchers were such that several Japanese fishing experts believed it doubtful if not impossible that successful mooring and unloading operations could be conducted by the Tenryu Maru on the high seas.

Although ideal wind and sea conditions prevailed throughout the operations, as was predicted, oftentimes excessive rolling of both the mothership and the

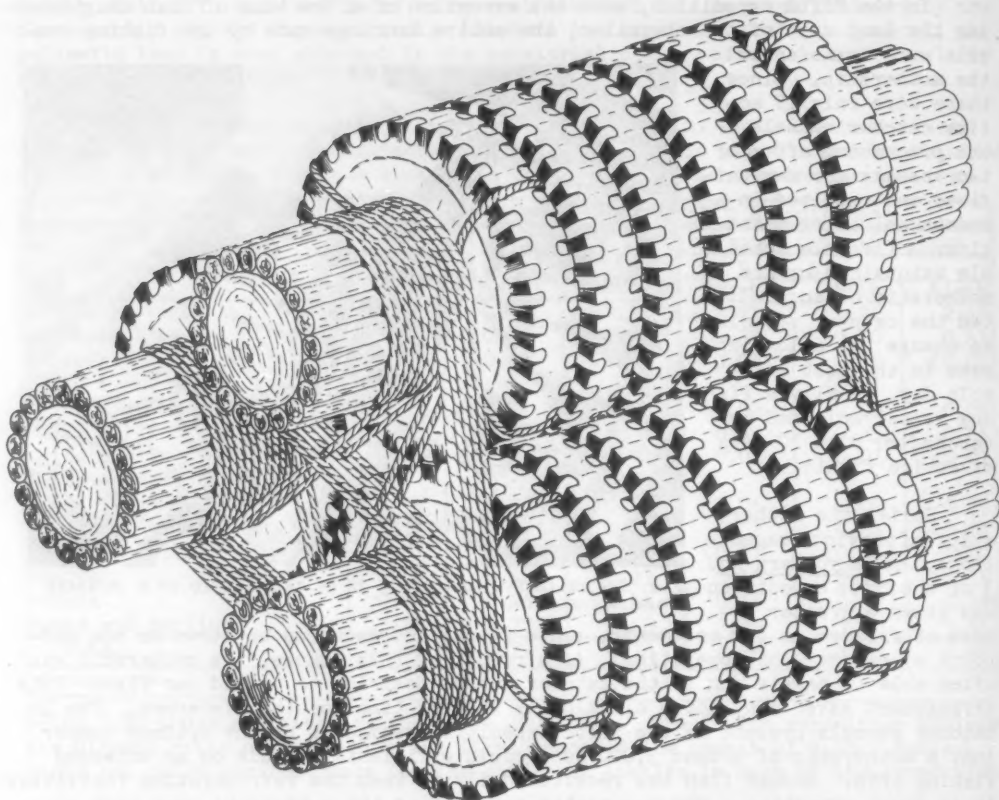


FIG. 4 - DIAGRAM OF A TRIPLE-FENDER USED DURING THE FOURTH JAPANESE TUNA MOTHERSHIP EXPEDITION.

catcher was caused by swells. Despite the obstacles encountered, a highly satisfactory method of mooring the catcher vessels was developed. To a large degree, successful mooring operations and consequently the favorable outcome of the third, fourth, and sixth expeditions depended upon the strategic use of suitable fenders. Therefore, detailed descriptions of the use and construction of the fenders will be given.

The fenders used on the third expedition were made by passing a core of seasoned pine logs through the rim holes of six truck tires. By lashing the tires and logs together with manila and wire ropes, the component parts of the fenders

were secured. Two of these buoyant fenders were lowered, floated into place fore and aft, and secured to the mothership with loose bridles of wire rope before the catcher pulled alongside. In the first few trials it was found that the width of the fenders was insufficient to prevent bumping entirely.

In the second trial, a fender of double the width was made by lashing together two fenders. This arrangement, though much more satisfactory than a single fender, still did not eliminate all bumping. Normally, the double fender floated flat with the two sets of tires lying alongside each other; however, when both vessels surged together with too great a force, the fender rolled on its side permitting contact of the vessels.

On the fourth expedition the fenders evolved for the Tenryu Maru through experience gained in the previous expedition proved to be satisfactory in all ways. Basically, the fenders were constructed as before with six truck tires lashed around a core of seasoned logs. Three sets of these fenders were fastened together with wire rope into a cluster, making a single large fender which offered sufficient width at all times, regardless of the roll of the vessel or the fender. The triple fender was about 6 feet in width and 7 feet in length (figure 4). Two large triple fenders floated fore and aft prevented all bumping.

The fenders carried to the fishing ground by the Tosui Maru, the auxiliary mothership, though similar in design to those carried by the Tenryu Maru in the fourth expedition were built with a seemingly minor detail ignored which proved to be most costly. The core of wood which was stuffed through the rim holes of the tires consisted of unseasoned logs and strips of green bamboo which rendered the fender non-buoyant when placed in the water. During periods of excessive rolling, the fenders sank below the hull curvature of the catcher vessel. The weight of the catcher vessel riding on the fender parted the wire rope bridles in two successive trials. In the first parting, because of indecision and delay in casting off the fishing vessel, extensive damage was sustained by the auxiliary mothership and the catcher. The steel plates of the Tosui Maru were badly buckled and the outboard fishing rack of the catcher vessel was completely demolished at the point of contact. To continue unloading operations, two buoyant fenders were borrowed from the Tenryu Maru and the transfer of fish and supplies was completed without mishap.

With the exception of the auxiliary mothership, the Tosui Maru, all carrier vessels of the six expeditions used the yard-and-stay method for transferring fish and supplies from one vessel to another. Where the fixed derrick system was used, the manner of hoisting fish was found to be very similar to that described by Shimada (1951). Since the Tenryu Maru was equipped with only a single foremast cargo boom, the spring stay extending from the foremast to the mainmast was used in place of a hatch boom.

Aboard the Tosui Maru a slewing derrick was employed for transferring fish. The fish were raised and lowered by a whip connected to the drum of an electric deck winch. For slewing fish inboard, three men aboard the Tosui Maru manned a side guy while the outboard-swinging guy extended clear to the deck of the vessel unloading, where it was handled by three men. Working the outboard-side guy aboard the catcher vessel made it difficult and dangerous to control the slewing motion of the boom when the vessels swung or rolled badly. Also, the roll of the receiving vessel imparted a pendulum action to the single whip which often caused the cargo of fish to be slammed against the bulwarks.

Where ease of handling, economical use of manpower, safety, and speed are concerned in transferring cargo out in the open sea, the yard and stay method was found to be far superior to the slewing derrick system.

In the fifth expedition, crushed ice was supplied to the catcher vessels at the end of each unloading. This operation proved to be one of the most inefficient aspects of the entire mothership operation. The ice flowing from the ice crusher on the bridge deck down a 10-foot metal chute tended to pocket itself in the canvas sleeve attached to the end, and required at least three additional men to work the ice out. This stoppage at the canvas sleeve was largely caused by the insufficient incline of the chute from the crusher to the catcher vessel.

Some improvement was noticed when the canvas sleeve was discarded and the metal chute lengthened a few feet. However, even in the slightest sea, the catcher vessels rolled enough to cause the chute to pull away from the hatch, causing the ice to drop on the deck. Often the chute fell short of the catcher ship itself, and it required three men on the mothership tending side guys and the topping lift to prevent the chute from getting crushed between the two ships.

Under the best conditions, the mothership was able to deliver about 20 tons of ice in one hour.

HANDLING AND PROCESSING OF FISH

The major objective of the first, second, and fifth expeditions was to produce the greatest possible quantity of tuna frozen in the round for the export trade. For domestic consumption, a substantial part of the tuna catch which did not meet quality standards for whole freezing was processed into frozen fillets and the remainder was preserved in ice.

In contrast, most of the fish caught on the third, fourth, and sixth expeditions, conducted by the Nansei Fisheries Company, were slated for the fresh fish markets of Japan. These fish were iced rather than frozen. Considering the short duration of these expeditions, such a method of preservation was found to be adequate. Also, it is claimed that the flavor and texture of tuna and marlin which are to be consumed raw as "sashimi" are impaired by freezing.

Since the gills and viscera of the fish had been removed aboard the fishing vessels immediately after capture, the stowing of the whole fish aboard the Nansei Fisheries Company's receiving vessels was a relatively simple procedure. The fish were first hosed down with sea water and the blood and slime clinging to the external surface and the body cavity were scrubbed off with a deck brush. After weighing by species, several at a time, on a 500-kilogram, single beam, portable platform scale, the fish were lowered by hand into the storage holds.

In stowing the fish in ice the body cavity was packed with crushed ice and then the catch was covered with ice equivalent to the weight of the fish. Whenever possible, shark were stored in the bottom of the hold followed by marlin with tuna placed on top. Between layers about three fish deep, tiers of wooden partitions were placed to prevent crushing of the lowermost fish.

To prevent the rapid melting of ice aboard the Tenryu Maru, a 70-horsepower hot-bulb engine drove an ammonia compressor which by an indirect expansion system cooled the calcium chloride brine passing through the coils installed on the top and all four sides of the fish holds. With this cooling system, a temperature of -2° to -5° C. (23° to 28° F.) was maintained in the holds.

As an experimental venture, a few tuna and marlin received aboard the Tenryu Maru during the fourth expedition were first immersed in -4° to -8° C. (18° to 25° F.) sodium-chloride brine for a period of 4 to 12 hours. After immersion in brine, the fish were packed in ice and stored in the hold containing the rest of the iced

fish. A few organoleptic examinations of these fish a week after being placed on ice showed very favorable results. The color as well as the texture and firmness of the flesh showed no perceptible difference from freshly caught fish. In addition, about 10 tons of yellowfin tuna were dry frozen in the forward fish hold where the temperature was maintained at -8°C . (18°F). These fish were frozen as possible trial exports to canners in the United States.

The fish-handling and processing methods in the fifth expedition were very similar to those reported by Shimada for the first expedition. A full description will, therefore, not be necessary except for a brief account of the freezing details.

For fish to be frozen in the round, the *Tenyo Maru No. 3* employed the method of brine-freezing and subsequent dry storage. Each of the three brine tanks measured 4 feet in width, 12 feet in length, and 5 feet in depth. The sodium-chloride brine solution was cooled to a temperature between -13°C . and -21°C . (-6° to 9°F .) by a system of herringbone ammonia coils. Each brine tank had a holding capacity of approximately 200 fish of 85 pounds average weight, the estimated total capacity of the three tanks being 22.5 metric tons.

The buoyant effect of the dense brine was overcome by using a makeshift press to keep the fish immersed during the freezing cycle. Three 2-hp. motors were used to circulate the brine in the tanks, thereby insuring a satisfactory heat exchange between the brine and the fish. Fish were kept in the brine for 16 to 26 hours, depending upon the number and size of fish being frozen, and were frozen to a mid-body temperature between -4°C . and -10°C . (14° to 25°F). After reaching a suitable temperature, the fish were taken out of the brine, and stored in the cold-storage hold.

The quick-freezing chamber on the mothership was capable of handling approximately 16 tons of fillets at one time. The

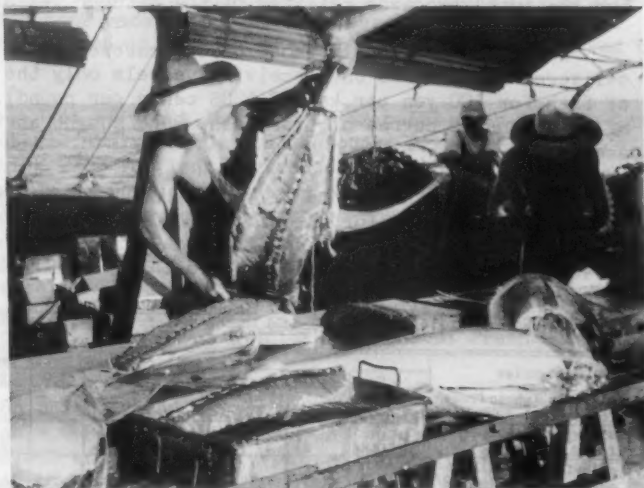


FIG. 5 - A WORKER FILLETING A YELLOWFIN TUNA ABOARD A JAPANESE TUNA MOTHERSHIP.

fillets required approximately 20-24 hours in the freezing chamber before being cooled to a temperature between -4°C . and -12°C . (10° to 25°F). At this temperature the fillets were taken out of the chamber, removed from the pans by immersion in salt water, glazed in fresh water of 1°C . (34°F), placed in cardboard boxes, and stored in the cold-storage hold. Other details are given in Shimada's (1951) report of the first expedition. The mothership was able to process approximately 38.5 tons of fish a day; 22.5 tons of fish to be frozen in the round, and the remainder in fish to be filleted.

PROCEEDS FROM SALE OF FISH

In all six expeditions the catcher vessels disposed of their catches by either transporting the fish back to Japan and selling them in the home market or by selling the fish directly to the mothership while out on the fishing grounds.

Table 5 - Total Proceeds Realized by Catcher Vessels^{1/} of the Japanese Tuna-Mothership Expeditions

Expedition	Disposition of Fish	TUNAS			MARLINS			SHARKS ^{2/}			OTHERS ^{3/}		
		Weight (lbs.)	Proceeds (US\$)	US Cents per lb.	Weight (lbs.)	Proceeds (US\$)	US Cents per lb.	Weight (lbs.)	Proceeds (US\$)	US Cents per lb.	Weight (lbs.)	Proceeds (US\$)	US Cents per lb.
I	Sold to Mothership	5,149,035	272,956	5.3	1,699,071	66,186	3.9	812,015	8,184	1.0	20,468	807	3.9
	Sold in Port ^{2/}	198,173	30,265	15.3	151,874	21,314	14.0	82,682	4,211	5.1	2,377	226	8.8
II	Sold to Mothership	3,667,622	180,501	4.9	1,669,817	57,598	3.4	402,518	4,087	1.0	37,970	1,381	3.6
	Sold in Port	59,646	3,004	5.0	7,982	244	3.1	1,198	198	1.6	154	5	3.2
III	Sold to Mothership	403,785	52,020	12.9	77,122	7,918	10.3	30,830	1,034	3.4	3,812	120	2.5
	Sold in Port	276,003	15,195	5.5	133,239	6,270	4.7	16,346	490	3.0	4,815	120	2.5
IV	Sold to Mothership	679,113	91,394	13.5	187,012	24,214	12.9	11,735	407	3.5	6,505	458	7.0
	Sold in Port	3,190,872	196,016	6.1	719,874	36,202	5.0	383,299	6,462	1.7	23,205	735	3.2
V	Sold to Mothership	47,998	5,130	10.7	7,209	698	9.7	2,439	76	3.1	347	7	2.0
	Sold in Port	343,423	14,578	4.2	84,876	3,152	3.7	16,605	510	3.1	8,831	270	3.1
VI	Sold to Mothership	509,946	28,968	5.7	140,075	8,089	5.8	22,920	512	2.2	7,427	178	2.4
	Sold in Port												
TOTAL		14,525,616	889,027		4,678,151	231,909		1,787,585	26,141		116,242	4,377	

1/ STATISTICS PROVIDED BY THE JAPANESE FISHERY AGENCY AND CONVERTED INTO POUNDS AND DOLLARS, USING THE CONVERSION FACTORS OF 8.267 LBS. = 1 KAN AND US\$1 = 360 YEN.
 2/ MOST OF THE SHARKS CAUGHT DURING THE THIRD, FOURTH, AND PROBABLY THE SIXTH EXPEDITIONS WERE DISCARDED IN ORDER TO MAKE SPACE FOR MORE VALUABLE SPECIES AND ARE NOT INCLUDED IN THIS TABLE.
 3/ SOLD IN PORT REFERS TO FISH WHICH WERE CARRIED BACK TO JAPAN BY THE VARIOUS CATCHERS AND SOLD TO THE HOME MARKETS.

In the Nansei-conducted expeditions, the bulk of the fish was brought back and sold in the Japanese ports by the catcher vessels themselves, while during the expeditions sponsored by the Taiyo and Hoko companies the greater part of the landings was delivered and sold to the motherships. Table 5 lists the disposition and the total proceeds realized by the catcher vessels of the various expeditions.

As stated previously, most of the catcher vessels of the Nansei expeditions delivered and sold to the receiving vessels only the minimum stipulated quantity of fish for 100 yen per kan (3.4 US cents per pound). The fish, if judged to be of a reasonable degree of freshness, were bought at this rate irrespective of species.

On the other hand, the Taiyo and Hoko motherships graded the fish by species and quality and paid for them accordingly. Table 6 gives the weights of each species of fish bought at the different prices by the Taiyo Company during the first expedition. It should be noted that most of each species sold for the top price.

Categories	PRICE (US cents per pound)											
	6.0	4.4	4.0	3.7	3.4	3.0	2.7	2.4	2.0	1.7	1.3	1.0
Yellowfin (whole frozen for export)	2,346,010		1,104	3,927				308				
Yellowfin (filleted for domestic use)	1,040,488		3,010	8,324			7,186	1,118				
Yellowfin (miscellaneous for domestic use) ^{2/}	60,488	10,676	179,587	405,455	6,867	8,112	44,272	122,898	75,722	12,257	385	
Gills ^{3/}	95,893											
Big-eyed tuna (filleted, iced)			577,302		61	274	4,300	39,849	4,549	742		
Small big-eyed tuna (frozen)					44		3,770	325	914	754		
Albacore (whole frozen for export)	40,572		141		1,166		13,930	703	480			
Skipjack tuna			1,543	18	588	997	502	655	1,608	78		
Black tuna			3,089									
Black marlin			1,461,984		2,086	6,514	101,242	10,345	25,691	3,324		
White marlin			34,340		160		7,501	1,355	1,227	42		
Striped marlin			1,085									
Sailfish			21,302		531	382	394	204	966	1,506	278	170
Swordfish			7,960		2,857	138	785	124	921	84	78	25
Sharks												804,830
Others ^{4/}			19,147		263	70	209	12	448	180		

1/ STATISTICS OBTAINED FROM TAIYO FISHING COMPANY THROUGH BELL M. SHIMADA. YEN PER KAN CONVERTED TO CENTS PER POUND BY USING THE CONVERSION FACTORS OF 8.267 LBS. = 1 KAN AND US\$1 = 360 YEN. THE WEIGHTS GIVEN ARE ROUND WEIGHTS FOR YELLOWFIN TUNA (GILLED), ALBACORE, AND SMALL TUNAS, AND DRAWN WEIGHTS FOR THE REMAINING SPECIES.

2/ INCLUDES ICED FISH AS WELL AS VERY SMALL FISH WHICH WERE WHOLE-FROZEN.

3/ ALLOWANCE GIVEN FISHERMEN FOR LOSS IN WEIGHT OF YELLOWFIN TUNA DUE TO REMOVAL OF GILLS.

4/ INCLUDES MISCELLANEOUS SPECIES SUCH AS DOLPHIN, WAHOO, AND BARRACUDA.

WORKING AND LIVING CONDITIONS OF THE JAPANESE FISHERMEN

With the available equipment and material on hand, the Japanese, after more than 60 years of experience, have introduced many changes which have increased the fishing potential as well as the handling efficiency of the tuna long-line gear. Despite these improvements, tuna long-lining remains one of the most strenuous and grueling methods of fishing practiced by the Japanese today. To a large degree this may be attributed to the fact that the Japanese boat owners prefer to use manual labor, rather than mechanize the operation to the fullest extent. Since the cost of labor in Japan is very low, it is the contention of the boat owners that it is far cheaper to use manual labor than to invest in mechanical equipment.

The setting of 50 to 60 miles of main line was accomplished in about 4 hours' time, while the retrieving operation required 10 to 14 hours of continuous work. In any fishing activity the entire crew participated, with each crew member working at high speed. The men received two rest periods of about 4 hours each during a fishing day. The first respite from work came in mid-morning after the line was completely set and the boat was drifting with the line. The second period of rest usually came after midnight upon completion of the retrieving operation and before the next set was made.

The crew's quarters in the long-line vessels were dirty, cramped, and ill-ventilated. On an inspection tour made of one of the vessels, it was observed that several bunks were of such diminutive size that the occupants were forced to sleep on their sides.

The men were fed on a budget of about 100 yen (28 US cents) per day per man. Rice and barley boiled together furnished the staple food. Dried vegetables, pickles, and non-perishables which keep for long periods of time under inadequate refrigeration were used to supplement the carbohydrate diet. Generally, only those fish damaged by sharks were used for consumption aboard the vessels.

The lack of sufficient quantities of fresh water caused one of the greatest discomforts aboard these vessels. The use of fresh water was limited strictly to drinking and cooking purposes. To give an idea of the scarcity of fresh water, it may suffice to mention that aboard certain vessels the use of fresh water for brushing teeth was forbidden by the captain.

No accurate information on the actual wages made by the crew members of the long-line vessels is available. However, fishermen who were interviewed claimed that they earned between 18,000 and 27,000 yen (US\$50-\$75) during a fishing trip of about a month's duration.

SUMMARY AND CONCLUSIONS

In Japan the production of tuna products has lagged far behind the ever-increasing demand. Moreover, the Japanese realize that the production in the coastal and offshore waters of Japan has already reached the practical maximum. Therefore, when the opportunity arose for the Japanese fishing industry to expand to the waters of the Trust Territory, they readily undertook the new venture.

These expeditions varied considerably in scale of operation. The largest expedition employed a mothership of 10,619 gross tons and a fishing fleet of 25 catcher vessels, while the smallest used a mothership of 577 gross tons and a fleet of 6 catchers. The periods of operation ranged from 24 to 84 fishing days and the areas of operation varied from 300 to 1,700 miles in the east-west direction and

from 240 to 500 miles in the north-south direction. Fishing vessels ranged in size from 56 to 196 gross tons, with a few of the smaller vessels being of wooden construction. The crews numbered from 16 to 54 men.

Since a large mothership was able to serve as storage and supply center for the fishing fleet, it enabled the expedition to remain at sea for a longer period of time and to operate in a wider area. The catcher vessel accompanying a small mothership, on the other hand, was forced to operate as a self-sufficient unit to a large extent, carrying most of its provisions, ice, bait, water, and fuel. The result was that such expeditions with small motherships were only able to be at sea for a relatively short time and to operate in a relatively small area.

The total catch by the six expeditions amounted to well over 20 million pounds of fish, with yellowfin tuna comprising more than 60 percent of this total. In terms of catch ratio, the average catch of tunas and spearfishes per 100 hooks per day for all six expeditions amounted to 3.70 fish. The fourth expedition achieved the highest ratio of 4.40, while the first expedition registered the lowest of 3.23.

The Taiyo Fishing Company and the Hoko Suisan Company directed much of their efforts toward obtaining fish for export, while the Nansei Fisheries Company supplied the home markets with fish.

Although adequate data are not available on which to base a conclusive statement on the financial success of these mothership-type tuna expeditions, the fact that the Taiyo Fishing Company has conducted two expeditions and that the Nansei Fisheries Company has undertaken three, can perhaps be taken as an indication of financial success. Moreover, these companies have indicated their desire to continue in this field.

Also from the point of view of the Japanese, these expeditions have been successful in the following aspects:

- a. They have found it financially and operationally feasible to exploit distant waters for fish which are of insufficient abundance in the Japanese home waters;
- b. They have given employment to thousands of fishermen and laborers during a period of critical work shortages in Japan;
- c. They have served to relieve the congestion of fishing vessels operating in Japanese waters by enabling some to accompany the expeditions;
- d. They have brought a means whereby the greatly increasing demand for tuna products at home can be supplied;
- e. They have become a source of additional revenue for Japan by supplying fish to the export market.

ACKNOWLEDGMENT

This report has been made possible by the High Commissioner for the Trust Territory of the Pacific Islands, the Supreme Commander for the Allied Powers, and the Japanese Government. The cooperation shown by the personnel of the Fisheries Division, Natural Resources Section, SCAP; the Taiyo Fishing Company, and the Nansei Fisheries Company is gratefully acknowledged. Inspectors Tomio Kato, Kisaburo Honda, K. Ishizuka, H. Inouye, Hirosaku Koda, and Heihachiro Kawamura of the

Japanese Fisheries Agency, who served on these expeditions, have rendered generous assistance in the gathering of materials pertinent to this report. The sketches used in this paper were prepared by Mr. Tamotsu Nakata, draftsman for the Pacific Oceanic Fishery Investigations, U. S. Fish and Wildlife Service, Honolulu, T. H.

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SURVEY OF THE FISHERIES OF THE FORMER JAPANESE MANDATED ISLANDS

Although the natives of the former Japanese mandated islands of the Pacific Ocean had occasionally taken tuna and comparatively large supplies were known to be present, the Japanese did not develop the tuna fishing in these island areas until around 1940. Probably the reason for this delay was due to the need for larger and better equipped vessels and additional facilities ashore, particularly refrigeration.

The establishment of a cannery in the Palaus did much to stimulate this industry. Experienced tuna fishermen from Japan with vessels ranging in size up to 60 net tons were just getting into production at the beginning of the war. The Palau cannery had a capacity of 500 cases per day, but it is doubtful if it operated at capacity for more than a short period in 1940. There was also limited production at Truk.

In contrast to the bonito fishery, where pole fishing was employed, the tuna industry was based solely on long-line fishing. Information obtained at Truk was to the effect that tuna vessels were frequently away from port two weeks or more, but the exact location of the areas fished was not determined.

Although tuna production was only in the neighborhood of two million pounds in 1941, there is every reason to believe that this industry would have expanded rapidly and perhaps reached as high a level as that for bonito in the course of another four or five years.

--Fishery Leaflet 273



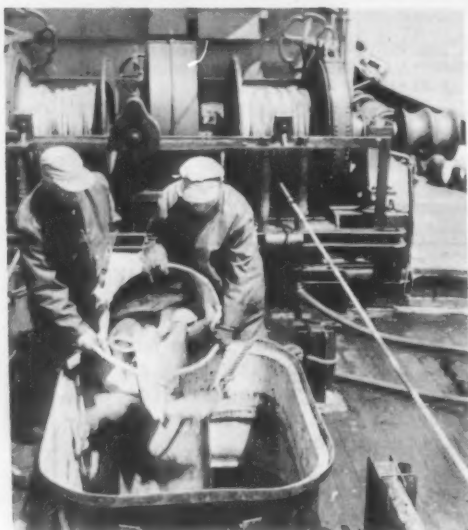
RESEARCH

IN SERVICE LABORATORIES



May 1952

REFRIGERATION: Freezing-Fish-at-Sea, Defrosting, Filletting, and Refreezing the Fillets: The research trawler Delaware returned to East Boston on May 12 from test cruise No. 7 with approximately 12,000 pounds of haddock. Half of the



FEEDING FISH ONTO CHUTE LEADING TO BRINE-FREEZER AREA ABOARD THE DELAWARE.



SORTING FISH ABOARD THE RESEARCH TRAWLER DELAWARE.

fish was brine-frozen in the round at sea; the remaining half was packed in ice in accordance with normal commercial practice. Part of the frozen fish was processed in a local plant in order to obtain data on fillet yields. Another part of the frozen fish was placed in cold storage and will be used to study the effects of prolonged storage of the round frozen fish on quality of the fillets, prepared by thawing these whole fish, filletting, and refreezing the fillets. The remainder of the fish is being used for dockside tests of the refrigeration equipment. (Boston)

* * *

Freezing Shrimp at Sea--Gulf States Area: A study was initiated on the handling and freezing of shrimp at sea. Preliminary field studies were carried out in the Gulf States area using the facilities of the Service's exploratory fishing vessel Oregon. The purpose of the study is to develop practical methods of handling shrimp aboard vessel in order to provide fresh or frozen shrimp of consistently good quality.

The Chief of the Fishery Products Laboratory, Ketchikan, Alaska, was detailed to carry out this study. Preliminary field work of two months duration was completed in the Gulf of Mexico aboard the Oregon. Samples of shrimp frozen at sea and ashore have been shipped to the Ketchikan (Alaska) laboratory for storage and quality comparison.

The work to date indicates that the application of brine-freezing at sea shows promise. Both whole and headless shrimp were frozen at sea in brine at temperatures of 0° to 10° F. and stored in air at 0° F. Examination after 4 weeks of storage indicated that the color, flavor, and texture of the brine-frozen shrimp were equal to shrimp packaged and frozen in air (-20° F.) at sea. Further storage tests must be completed to determine whether adverse flavor and texture changes occur in brine-frozen shrimp stored in air at 0° F.

Samples held in brine at 5° F. for periods up to 48 hours will be analyzed to determine the amount of salt absorbed by the shrimp. Also, shrimp which have been held in ice according to present commercial practice and then frozen in air at -20° F. will be tested in the laboratory.

Studies of shrimp-handling methods aboard the Oregon included tests on icing procedures and the effects of holding shrimp on deck prior to icing. Observations confirmed the belief that shrimp deteriorate very rapidly if allowed to stand on deck exposed to sun, air, and warm temperatures. To prevent this deterioration whenever delays aboard vessels do not permit icing of the shrimp immediately after catching and sorting, the use of an ice-water chilling tank aboard the vessel is suggested. Shrimp could be sorted directly into the chilled sea-water, then when time permits they could be taken from the chilling tank, heads removed and iced in the hold in the usual manner. There is no question that the quality of the shrimp suffers greatly if immediately after "decking" prompt chilling or icing is not carried out aboard vessel. In icing the shrimp, the most important factor is to spread the ice into the layers of shrimp so that each individual shrimp will be cooled by direct contact with the melting ice. Layers of warm shrimp without sufficient ice will delay the chilling of those in the middle and cause quality loss. Granular-type ice (neither too coarse or fine) is recommended for icing the shrimp. Coarse ice tend to bruise the tender shrimp and fine ice does not allow adequate drainage through the mass. (Ketchikan)

* * *

ANALYSIS AND COMPOSITION: Composition and Cold-Storage Life of Fresh-Water Fish: The proximate composition of 16 individual Columbia River smelt was determined. The data are presented in the following table:

Composition of Edible Portion of Columbia River Smelt (*Thaleichthys pacificus*)

Sample No.	Proximate Composition in Percent				Sample No.	Proximate Composition in Percent			
	Moisture	Oil	Protein	Ash		Moisture	Oil	Protein	Ash
1	79.2	6.25	14.3	1.27	9	79.6	8.98	14.5	1.23
2	81.2	5.10	15.0	0.96	10	81.1	5.38	14.6	1.37
3	81.0	6.98	13.2	1.12	11	79.9	5.82	14.5	1.37
4	79.1	5.62	15.3	1.18	12	79.4	7.71	14.4	1.28
5	80.9	6.70	14.1	1.16	13	77.7	5.48	15.3	1.30
6	80.8	8.79	14.3	1.27	14	78.4	5.19	15.3	1.33
7	76.5	5.53	14.4	1.25	15	81.3	4.59	15.0	1.29
8	79.9	5.57	15.1	1.40	16	77.2	6.27	14.6	1.21
Average						79.6	6.25	14.6	1.25

These data show that the Columbia River smelt has a proximate composition different from that of any other species of fish examined. Previous data collected at the Seattle laboratory as well as data of other workers, indicated that the sum of moisture plus oil content of most fish was about 80 (percent). Very rarely was this total as high as 83. For the Columbia River smelt, the sum of the oil plus moisture contents averaged 85.8 (percent) with individual analyses as high as 89.6.

The protein content of the Columbia River smelt also showed considerable variation from the normal in other fish. The protein content of most species of fish ranges from 17 to 20 percent; however, the protein content of the Columbia River smelt averaged only 14.6 percent, with a low individual value of 13.2 percent.

EYPRODUCTS: Vitamin Content and Nutritive Value of Fishery Products: Vitamin B₁₂ assays of eight organs separated from the pilchard were carried out. The kidney has the highest vitamin B₁₂ content, with the liver ranking a poor second.

Item	Vitamin B ₁₂ Content	
	Micrograms	Per Gram (Wet Basis)
Liver	0.43	
Stomach	0.044 to 0.191/	
Gonads	0.23	
Intestine	0.018 to 0.0931/	
Kidney	1.48	
Heart	0.35	
Spleen	0.095	
Pyloric caeca	0.08 to 0.291/	

1/RANGE OF VALUES ARE REPORTED FOR THE STOMACH, INTESTINE, AND PYLORIC CAECA SINCE VARIATIONS WERE FOUND FOR EACH ANALYSIS. IT IS BELIEVED THAT THE VARIATION WAS CAUSED BY INHIBITORY SUBSTANCES PRESENT IN THESE ORGANS.

(Seattle)

* * *

TECHNOLOGICAL PROGRAM MEETING NOT SCHEDULED FOR THIS YEAR: At this time of year the Technological Section of the Branch of Commercial Fisheries usually announces its annual meeting with representatives of the fishing industry. These meetings, which are held to formulate the research program for the succeeding fiscal year, normally take place during the last week in June. This year, however, the industry meeting will not be held.

A careful review of our present research program has indicated that it would not be feasible to alter or conclude by June 30, 1952, any of the major projects which are now in progress. Since these projects were initiated after consultation with members of industry and were considered the most vital of those suggested in June 1951, it seems logical that they be continued until they have been satisfactorily completed.

A meeting is definitely scheduled for next year (June 1953), for at that time many of the present projects will have been completed.

If one or more of the current projects are completed and research personnel and laboratory facilities become available before June 1953, work will be initiated immediately on one of the other projects which were suggested at the last meeting but which could not be included in the present program.

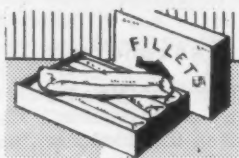
Research work on the current technological program as published in the November 1951 Supplement of Commercial Fisheries Review is proceeding according to plan. A summary report of the progress on the technological research of fiscal year ending June 30, 1952, will be published in the near future.



SALES POSSIBILITIES FOR FROZEN FISH INCREASE

Several railroad companies are now experimenting with pre-cooked frozen foods for diner use. The meals (from soup to dessert) are cooked and frozen in central kitchens and then put aboard the trains. As needed, they are thawed, heated, and served. The railroads have found this innovation so promising that they are now trying to expand its use to more extensive menus. Swordfish has been tried successfully. Undoubtedly more menus which included fish are being considered. This may be an opportunity for enterprising fish dealers to assist the railroads in developing this new idea.

The sale of frozen fish in wholesale quantities to home-freezer owners is a possibility worth exploring. Already there are approximately four million home freezers in use in the nation. Many owners want to buy frozen foods at quantity prices to place in their freezers. Some sellers of home freezers are giving their customers lists of frozen-food distributors who sell frozen foods on this basis. Other home-freezer distributors sell their customers frozen foods at the same time that the home freezer is purchased. Frozen fish dealers who want to sell more fishery products in quantity to individuals should work closely with their local home-freezer distributors, and cater to home-freezer owners. In so doing, they will be tapping and expanding new markets for fishery products.



These sales possibilities for selling frozen fish indicate the ever-broadening market for frozen fishery products. Advantage should be taken of these opportunities in order to increase the national consumption of fish and shellfish.

TRENDS AND DEVELOPMENTS

Additions to the Fleet of U. S. Fishing Vessels

A total of 64 vessels of 5 net tons and over received their first documents as fishing craft during April 1952--38 less than in April 1951. Alaska led with 23 vessels, followed by Washington with 10 vessels and California with 7 vessels, the Treasury Department Bureau of Customs reported.

Vessels Obtaining Their First Documents as Fishing Craft, April 1952					
Section	April		Four mos. ending with Apr.		Total
	1952	1951	1952	1951	1951
	Number	Number	Number	Number	Number
New England	2	3	6	8	36
Middle Atlantic	3	2	12	15	34
Chesapeake Bay	2	2	19	6	36
South Atlantic	3	9	29	31	118
Gulf	13	21	39	68	173
Pacific Coast	18	43	52	81	284
Great Lakes	-	4	4	5	25
Alaska	23	18	47	29	71
Hawaii	-	-	-	1	3
Total	64	102	208	244	780

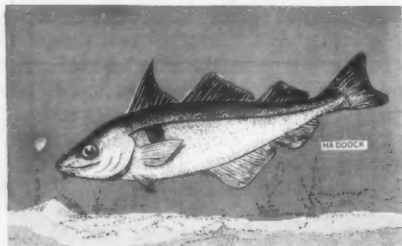
NOTE: VESSELS HAVE BEEN ASSIGNED TO THE VARIOUS SECTIONS ON THE BASIS OF THEIR HOME PORT.



Advisory Committee to U. S. Commissioners on Northwest Atlantic Fisheries Treaty Meets

Members of the Advisory Committee to the United States Commissioners on the Northwest Atlantic Fisheries Treaty met at Boston on May 15 to discuss the forthcoming meeting of the International Commission.

When the full Commission meets June 30 to July 9 at St. Andrews, it will consider a regulation under which boats fishing for haddock on Georges Bank would increase the sizes of net meshes from the present size of about 3 inches to a full 3-3/4 inches. That regulation is being proposed to prevent the destruction of millions of pounds of small, unmarketable haddock. The U.S. Fish and Wildlife Service recommended to the Committee that "check" boats be used so that the effect of the proposed regulation upon haddock stocks may be studied accurately.



The Advisory Committee, made up of representatives of labor, industry, and the public, agreed with the Service officials who said that for statistical purposes several

"check" boats should be allowed to use the smaller-mesh nets. The Service spokesman said he believed six or eight "check" boats would be necessary and that they would be allowed to use the smaller-mesh nets only under Government supervision. The Committee approved a plan under which a limited number of fishing vessels will be excepted from the proposed new larger-mesh net regulations if the regulations are accepted by the International Commission. The members of the Committee recommended that the plan for allowing exceptions to the larger-mesh nets be rotated to cover as many boats as possible over a period of several years.

Patrick McHugh, Secretary-Treasurer of the Atlantic Fishermen's Union (AFU), was designated by the Committee to act as its official delegate to the St. Andrews meeting. Thomas D. Rice, Executive Secretary of the Massachusetts Fisheries Association, was designated as alternate.

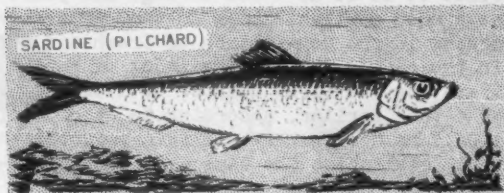
Francis W. Sargent, Director of the Massachusetts Division of Marine Fisheries and one of the three U. S. treaty commissioners, presided at the Committee meeting. Dr. John L. Kask, Assistant Director of the U. S. Fish and Wildlife Service and a U. S. Commissioner, attended.

The International Northwest Atlantic Fisheries Commission is made up of six nations--the United States, the United Kingdom, Canada, Iceland, Denmark, and Spain. Four other nations--Portugal, Italy, Norway, and France--have signed the treaty, but have not yet ratified the agreement.



California Sardine Reduction Quota for 1952-53 Announced

California fish processors who reduce sardines (pilchards) into commercial oils and meals will have a maximum quota of 100,000 tons for reduction in the 1952-53 fishing season. The California Fish and Game Commission lowered the annual quota by one third after hearing a report from the Marine Fisheries Laboratory that only 1,022 tons were reduced in the 1951-52 season when the Commission had set a maximum quota of 150,000 tons. The action was taken at the Commission's May meeting in Alameda.



At the same time, Commissioners granted 90 applications to reduce sardines for other than human food use. (Last season 97 applications were granted.) Each permittee's individual quota for the coming season will amount to about 1,100 tons.

The establishment of an annual reduction quota is the Commission's only regulatory power over the California commercial fishing industry. All other sardine fishing regulations are controlled by the Legislature.



Federal Purchases of Fishery Products

FRESH AND FROZEN FISH PURCHASES BY DEPARTMENT OF THE ARMY, APRIL 1952: The Army Quartermaster Corps during April 1952 purchased 2,849,408 pounds of fresh and frozen fishery products for the military feeding of the U. S. Army, Navy, Marine Corps, and Air Force (see table).¹ This was an increase of 19.9 percent in quantity and 19.3 percent in value over March purchases and an increase of 4.4 percent in quantity and 16.7 percent in value over April 1951 purchases.

Purchases of Fresh and Frozen Fishery Products by Department of the Army (April and the First Four Months, 1951 and 1952)							
Q U A N T I T Y				V A L U E			
April		January-April		April		January-April	
1952	1951	1952	1951	1952	1951	1952	1951
lbs.	lbs.	lbs.	lbs.	\$	\$	\$	\$
2,849,408	2,729,426	9,716,797	8,647,236	1,316,859	1,128,474	4,546,503	3,616,945

Purchases for the first four months of 1952 were greater by 12.4 percent in quantity and 25.7 percent in value as compared with January-April 1951. The average price per pound of 46.8 cents paid for fresh and frozen fishery products during the first four months this year was higher than the 41.8 cents per pound paid during the same period a year earlier.



Fishery Products Marketing Outlook, April-June 1952

Civilian supplies and consumption of fishery products in 1952 apparently have been running at about the same level as a year earlier, and are expected to continue to do so at least through mid-year. Slightly less canned fish commodities have been available than in the comparable period of 1951, but the indicated increase in the consumption of fresh and frozen products about offset the decline in the canned items. The index of retail prices of all fishery products in urban areas for the first quarter of 1952 averaged 350.2 (1935-39=100)—about the same as a year earlier, according to reports of the Bureau of Labor Statistics. Indications are that retail prices during the second quarter may decline a little to a level about the same as in the April-June months of 1951.

Production: The commercial catch of fishery products during the winter of 1952 was somewhat smaller than a year earlier. Part of the decline resulted from the fact that unfavorable weather hampered commercial fishing operations off the New England coast. Besides weather conditions, economic factors were partly responsible for a shift in the type of fishing operations. The strong market demand for cod and haddock encouraged fishermen to concentrate their production activities on these species, with less emphasis on fishing for ocean perch than in the winter of 1950-51.

Freezings and Holdings: Commercial freezings of edible fishery products in the United States and Alaska during January-April totaled 54.3 million pounds, 0.9 percent greater than in the same months last year. All of the increase occurred during January; freezings in the three subsequent months were not quite as large as a year earlier. The volume of fishery products frozen is expected to increase by mid-1952, reflecting the seasonal expansion in landings. Cold-storage holdings are nearing their seasonal low, but are running much higher than a year earlier. On May 1, 1952, they amounted to about 113.5 million pounds, 27.9 percent above those on the preceding May 1 and the largest on record for that date.

Canned Fish: Total supplies of canned fish were a little smaller in January-April than a year earlier. Slightly more pink salmon was available, but supplies of the other popular species of canned fish were somewhat smaller. Prospects are that total supplies will continue below a year earlier at least until after mid-year, when the new packs start moving into distribution channels.



TYPICAL NEW ENGLAND LARGE TRAWLERS DOCKED AT THE END OF THE BOSTON FISH PIER. PRODUCTION BY THESE TRAWLERS BEGINS TO INCREASE BEGINNING WITH MARCH AND REACHES A PEAK IN JUNE AND JULY EACH YEAR.

Foreign Trade: Imports of frozen fillets of ground-fish (cod, haddock, hake, pollock, cusk) and ocean perch during the first four months of this year totaled 42.7 million pounds, more than 35 percent above a year earlier. Indications at this time are that imports of these products will continue at a high rate during the second quarter. Exports of canned fishery products during January-March lagged significantly behind the rate in the same months of 1951. The decline in exports was in large part due to foreign trade restrictions and, to a lesser extent, to smaller supplies and higher prices than last year of the species of canned fish which are popular abroad. Exports of canned fishery products during the second quarter of 1952 probably will continue at a lower rate than a year earlier.

This is a partial abstract of a report prepared by the Bureau of Agricultural Economics, U. S. Department of Agriculture, in cooperation with the U. S. Fish and Wildlife Service, and published in the former agency's April-June 1952 issue of The National Food Situation.



Metal Cans - Shipments for Fishery Products, March 1952

Total shipments of metal cans for fishery products for March this year amounted to 4,959 short tons of steel (based on the amount of steel consumed in the manufacture of cans), which was considerably below the 5,458 short tons of steel during the corresponding month in 1951. A decline in West Coast tuna canning was largely responsible for this drop in use of metal cans for packing of fishery products. This is based on a report issued by the Bureau of the Census on May 21.



Shipments of metal cans for fishery products for the first three months this year amounted to 13,634 short tons of steel, compared with 16,751 short tons of steel for the corresponding period in 1951.

NOTE: DATA CONVERTED TO SHORT TONS OF STEEL ARE ON THE BASIS OF 23.0 BASE BOXES OF STEEL PER SHORT TON OF STEEL.



North Atlantic Fishery Investigations

LARGER-MESH NETS TO BE TESTED BY SERVICE: Through cooperation with the fishing industry, biologists from the Woods Hole Station of the Service's Northwest Atlantic Fishery Investigations will sail on the trawler Michigan to test larger-mesh nets in order to obtain information necessary for the management of the North Atlantic offshore groundfish fisheries. The vessel with its regular crew will fish on Georges Bank on a normal commercial cruise, except that the mesh size of the trawl nets used will be larger than regularly used.

The purposes of the experiments are: (1) to determine whether an experimental cover on the cod end of the net has any effect on the escapement of haddock, (2) to determine the selectivity of various sizes of meshes on the sizes of haddock caught by otter trawls.

On the first cruise, a cod end with a 4-7/8-inch mesh (inside measurement) will be used. If time permits, some tows will be made with a cod end of 5-1/2-inch mesh. Port and starboard nets will be fished alternately, one with a 1-1/2-inch cotton cover and one uncovered. All haddock caught in the cod end and the cover will be measured.

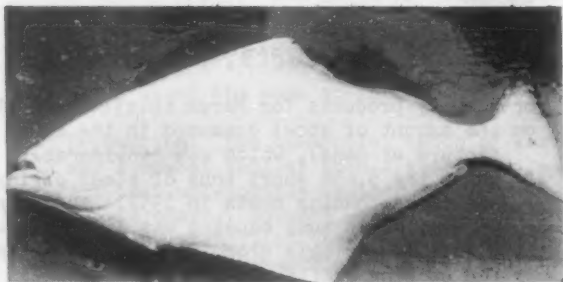
On the second cruise, testing of a 5-1/2-inch mesh cod end will continue and, if time permits, a standard commercial cod end (3-7/8 inch) will be tested also.

The vessel will leave on the first cruise from the Boston Fish Pier June 4, 1952, and return June 12.



Pacific Halibut Areas 1B and 2A Closed

The International Fisheries Commission announced May 28 that Pacific halibut Areas 2A and 1B would be closed at midnight (PST) June 8, 1952, to all halibut



fishing, except that provided for in Section 5 of the 1952 Pacific Halibut Regulations and Article 1 of the Convention. By that date the Commission estimates that the quota of 25,500,000 pounds for Area 2A will have been filled. No quota was established for Area 1B, but this area is to be closed with Area 2A. These two areas in 1951 were closed at midnight (PST) on May 28. However, the season this year opened

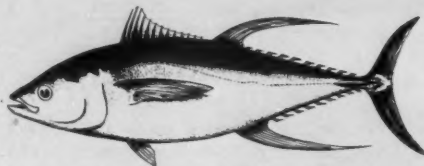
at 12:01 a.m. (PST) May 14 instead of 12:01 a.m. May 1 as it did in 1951. The 1952 season for Areas 2A and 1B will be only 26 days long, compared with 28 days in 1951, 32 days in 1950, 34 days in 1949, 32 days in 1948, 39 days in 1947, and 42 days in 1946. No closing dates have been announced as yet for other areas.

Area 2A includes all convention waters off the coasts of the United States and Alaska and Canada between Area 1B and a line running through the most westerly point of Glacier Bay, Alaska, to Cape Spencer Light, thence south one-quarter east, and is exclusive of Areas 2B and 2C, and of the nursery areas. Area 1B includes all convention waters between a line running northeast and southwest through Cape Blanco Light and a line running northeast and southwest through Willapa Bay Light on Cape Shoalwater.

Pacific Oceanic Fishery Investigations

QUALITY OF EQUATORIAL CANNED YELLOWFIN TUNA EXAMINED: The quality of canned equatorial yellowfin tuna was examined by the Service's Pacific Oceanic Fishery Investigations through cooperation with Hawaiian Tuna Packers, Ltd., according to a May 15 report.

Yellowfin of various sizes as well as groups handled in various ways after capture were canned separately and are now under study. Preliminary examinations indicate that yellowfin of 140 pounds produce a canned product only slightly inferior to yellowfin of 80 pounds. None of the canned product from the equatorial cruise showed "blood streaks," a common problem among tuna packers. Fish purposely bled upon capture produced no better canned product than the unbled fish.



YELLOWFIN TUNA (*NEOTHUNNUS MACROPTERUS*)

PROGRAM FOR FY 1953: At the annual meeting of the Industry Advisory Committee of the Pacific Oceanic Fishery Investigations held in San Francisco Marcy 25-26, the following future program for the Investigations was decided upon:

1. Continuation of the survey and investigation of equatorial yellowfin tuna stocks south of the Hawaiian archipelago and eastward to about 120° W. longitude in relation to features of the equatorial current system.

2. Continuation of skipjack studies in the Hawaiian archipelago with emphasis on off-season whereabouts of skipjack. Possibilities for sampan live-bait fisheries along the leeward islands to be considered, and if feasible, survey work to be undertaken on bait supplies and adjacent tuna supplies.

3. Continuation of tuna reaction studies as bearing on live-bait substitutes.

4. By charter arrangement, determine productivity on a commercial basis of equatorial long-line fishing by vessel operating on a share basis.

As opportunity affords:

5. Continuation and extension of research designed to develop sources of high-seas bait suitable for live-bait fishing.

6. Consider, devise, and employ instrumental or other means to discover stocks of skipjack and small yellowfin as surface schools or beneath the surface or in other states of aggregation.

7. Investigate means of improving long-line catches by:

a. Increasing knowledge on depths to reach with hooks to get maximum catches.

b. Gear and gear-handling improvements.

To be held in indefinite abeyance:

8. Investigation of equatorial regions west of 180°.

NEW VESSEL READY: The new vessel (Charles H. Gilbert) built for the Investigations was accepted by the Service in Tacoma, Washington, on April 30. The vessel proceeded to San Diego immediately where it was docked for minor alterations. About May 20 the vessel sailed on an experimental fishing cruise across the equator at 120° and 130° W. longitude.

* * * * *

PURSE SEINER CHARTERED TO TEST COMMERCIAL TUNA FISHING SOUTH OF HAWAIIAN ISLANDS: A large Pacific Coast purse seiner (Cavaliere) has been chartered by the Service's Pacific Oceanic Fishery Investigations to test the commercial tuna-fishing possibilities in the equatorial region south of the Hawaiian Islands. The vessel arrived in Honolulu on May 16 from San Francisco.

Explorations and experimental fishing in the region of the central Pacific Ocean during the past 2½ years have uncovered large populations of big yellowfin tuna in a band along the equator south of the Hawaiian Islands. The scheduled trip of the Cavaliere to this region will test the feasibility of commercial ex-

exploitation of these new-found tuna stocks. If the trip is successful, it is anticipated that both Hawaiian and West Coast commercial interests will follow the Cavaliere's example, and it is hoped that a large commercial fishery may eventually develop utilizing this untapped vast fisheries resource.

The charter of the Cavaliere specifies that the vessel must fish at least 30 days in the equatorial region. The catch belongs to the crew and vessel and will be sold either in the Hawaiian Islands or on the West Coast depending upon the best price bid at the conclusion of the trip.

The vessel underwent some changes in Honolulu to make it possible for the vessel to fish long-line tuna gear instead of the purse seine, and it sailed for the equator late in May. U. S. Fish and Wildlife Service research men are on board to study the catch and make biological observations in the region south of Hawaii.

The crew is made up of experienced long-line fishermen, mostly from Hawaii, while the vessel's master is a local fisherman and experienced navigator.



West Coast Tuna Clipper Lands Fare at Gloucester

A West Coast tuna clipper, Sun Jason, unloaded on June 7 at Gloucester, Massachusetts, a fare of tuna caught by pole and line (using live bait to chum the fish to the vessel) in the offshore waters off South America, mainly off Colombia. The 600,000 pounds of frozen tuna were purchased by a Gloucester fish cannery. After fishing for 45 days, the bait boat covered about 2,800 miles on its trip from the fishing grounds to Gloucester via the Panama Canal. The fish, which consisted mostly of yellowfin and skipjack tuna, were unloaded at a Gloucester freezer for storage.



TYPICAL CLIPPERS USED ON THE WEST COAST FOR FISHING TUNA WITH POLE AND LINE. LIVE BAIT IS USED TO CHUM TUNA TO VESSEL. THE SUN JASON IS A VESSEL SIMILAR TO THOSE SHOWN.

The Sun Jason, a San Diego, California vessel, was manned by a crew of 14. It is reported that the distance from the fishing grounds where the vessel fished to San Diego is practically equal to the distance from the fishing grounds to Gloucester. Two Gloucester fishing records were broken by the Sun Jason in landing tuna at that port: (1) the vessel landed the largest fare of tuna ever landed at that port and (2) the vessel covered the longest distance from fishing grounds to port of any fishing vessel unloading at that port.



Wholesale and Retail Prices

WHOLESALE PRICES, APRIL 1952: The usual seasonal climb in production which occurs in April accounted for the general drop in prices of fishery products at the wholesale level which occurred during that month. The edible fish and shellfish (fresh, frozen, and canned) revised wholesale price index for April 1952 was 105.2 percent of the 1947-49 average--3.9 percent below the previous month and 0.6 percent lower than in April 1951 (see table).

Except for salmon, most salt-water species of fresh dressed or whole finfish during April showed marked declines in prices. On the other hand, due to certain Hebraic holidays which occurred during the month, prices of most fresh-water varieties rose substantially. Drawn, dressed, or whole fin fish prices this April were 4.5 percent below the previous month, but still 7.7 percent higher than in April last year. Fresh large offshore haddock prices, which had dropped considerably from January to March, continued their downward trend. April prices for this variety were 20.6 percent less than in March, but 1.4 percent above April 1951. Frozen Western halibut prices at New York City, which had been rising steadily for several months, dropped 1.5 percent from March to April in anticipation of the opening of the new Pacific halibut season on May 14; however, these prices were still 10.0 percent higher than during the same period a year earlier. The opening of the new salmon season on the West Coast accounted for the higher prices reported for the first arrivals of fresh king salmon at New York City—prices were 8.5 percent higher than in March and 9.8 percent higher than in April 1951.

Table 1 - Wholesale Average Prices and Revised Indexes for Edible Fish and Shellfish, April 1952 with Comparative Data						
Group, Subgroup, and Item Specification	Point of Pricing	Avg. Prices (\$/lb.)	Indexes (1947-49 = 100)			
			April 1952	Apr. 1952	Mar. 1952	Feb. 1952	Apr. 1951
ALL FISH AND SHELLFISH (Fresh, Frozen, and Canned)						
Fresh and Frozen Fishery Products:			105.2	109.5	108.2	105.8
Drawn, Dressed, or Whole Fin Fish:			107.4	114.4	114.3	102.9
Haddock, large, offshore, drawn, fresh	Boston	.08	111.9	117.2	118.4	103.9
Halibut, Western, 20/80 lbs., dressed, fresh or frozen	New York City	.35	86.0	108.3	120.0	84.8
Salmon, king, lge. & med., dressed, fresh or frozen	" " "	.58	106.8	108.4	106.8	97.1
Whitefish, mostly Lake Superior, drawn (dressed), fresh	Chicago	.73	128.7	118.6	120.9	117.2
Whitefish, mostly Lake Erie pound or gill net, round, fresh	New York City	.90	179.7	161.1	156.2	146.0
Lake Trout, domestic, mostly No. 1, drawn (dressed), fresh	Chicago	.67	182.0	156.7	106.2	168.2
Yellow pike, mostly Michigan (Lakes Michi- gan & Huron), round, fresh	New York City	.40	137.3	133.2	133.2	121.5
Processed, Fresh (Fish and Shellfish):			93.8	155.9	99.7	98.5
Fillets, haddock, small, skins on, 20-lb. tins	Boston	.29	101.1	111.5	108.8	100.8
Shrimp, lge. (26-30 count), headless, fresh or frozen	New York City	.59	97.0	115.7	125.9	98.0
Oysters, shucked, standards	Norfolk area	4.50	93.3	110.7	102.8	90.4
Processed, Frozen (Fish and Shellfish):			111.3	111.3	111.3	113.6
Fillets: Flounder (yellowtail), skinless, 10-lb. pkg.	Boston	.39	103.8	109.6	110.9	107.2
Haddock, small, 10-lb. cello-pack Ocean perch (rosefish), 10-lb. cello-pack	"	.25	136.7	136.7	143.7	133.2
Shrimp, lge. (26-30 count), 5-lb. pkg.	Gloucester	.23	91.1	13.4	122.7	89.4
Canned Fishery Products:			110.7	13.2	120.4	122.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans per case	Chicago	.61	94.1	96.4	88.7	87.9
Tuna, light meat, solid pack, No. 3 tuna (7 oz.), 48 cans per case	Seattle	21.00	101.9	102.2	99.2	110.2
Sardines (pilchards), California, tomato pack, No. 1 oval (15 oz.) 48 cans per case ...	Los Angeles	14.25	109.6	109.6	109.6	130.4
Sardines, Maine, keyless oil, No. 1 drawn (3 1/2 oz.), 100 cans per case	" "	9.38	89.0	89.0	81.2	93.7
	" "	9.38	109.4	109.4	102.2	78.8
	New York City	9.65	102.7	105.9	105.9	69.4
1/REPRESENT AVERAGE PRICES FOR ONE DAY DURING WEEK BEGINNING APRIL 14.						

1/REPRESENT AVERAGE PRICES FOR ONE DAY DURING WEEK BEGINNING APRIL 14.

Processed fresh fish and shellfish April prices were 9.3 percent below March, but 0.3 percent above April 1951. Both fresh shrimp and fresh haddock fillets were quoted substantially below (16.0 and 16.2 percent, respectively) March levels. However, April prices for shrimp were 3.2 percent higher and for haddock fillets 1.0 percent lower than reported in the same month in 1951.

Lower prices for almost all frozen fillets accounted for the drop in the processed frozen fish and shellfish index of 5.3 percent from March to April; however, this index was still 0.6 percent higher than in April 1951. Although April frozen fillet prices were substantially below the previous month, prices for haddock fillets were still 1.9 percent and flounder fillets 2.6 percent higher than in April

1951, while ocean perch fillets were 9.9 percent lower. The frozen shrimp market weakened slightly and April prices dropped 2.4 percent below March levels, but were still 7.1 percent above April a year ago.

The April index for canned fishery products was 7.5 percent below the same month a year earlier and 0.3 percent below March. In April nearly all canned fishery products remained steady at March levels, except Maine sardines which were quoted 3.0 percent lower than in March. Compared with April 1951, this April's prices were 16.0 percent lower for pink salmon and 5.0 percent lower for tuna, but 38.8 percent higher for California sardines and 48.0 percent higher for Maine sardines.

RETAIL PRICES, APRIL 1952: Although between mid-March and mid-April there was a substantial increase (1.1 percent) in the prices paid for all foods by urban families of moderate incomes, retail prices of all finfish increased only slightly. The retail price index for all foods this April was 1.9 percent above the same month a year earlier.



Because of increased production at this time of the year, retail prices for fresh, frozen, and canned finfish dropped 0.4 percent from mid-March to mid-April and were 1.5 percent below the same period last year.

Fresh and frozen finfish prices from March 15 to April 15 also dropped 0.4 percent, but they were still 3.2 percent higher than in mid-April 1951. Canned finfish prices continued to decline and were 0.3 percent below mid-March and 9.6 percent lower than in mid-April last year.

Table 2 - Adjusted Retail Price Indexes for Foods and Finfish, April 15, 1952, with Comparative Data

Item	Base	I N D E X E S		
		Apr. 15, 1952	Mar. 15, 1952	Apr. 15, 1951
All foods	1935-39 = 100	230.0	227.6	225.7
All finfish (fresh, frozen and canned)	do	346.3	347.6	351.7
Fresh and frozen finfish	1938-39 = 100	295.5	296.7	286.4
Canned salmon: pink	do	459.3	460.9	508.1

Retail prices on April 15 for frozen ocean perch fillets averaged 46.4 cents per pound, while frozen haddock fillets averaged 50.7 cents per pound. The previous year frozen ocean perch fillets retailed at 46.9 cents and frozen haddock fillets at 50.2 cents per pound. Canned pink salmon retailed at an average of 56.8 cents per 16-oz. can, compared with 62.9 cents per can in mid-April 1951.

Table 3 - Average Retail Prices and Price Ranges of Individual Finfish Products, April 15, 1952

Product	Unit	United States	
		Average	Range of Prices
Frozen Finfish Fillets:			
Ocean perch ¹	lb.	46.4	29-75
Haddock ²	lb.	50.7	30-69
Canned Finfish:			
Salmon, pink	16-oz. can	56.8	42-77
1/ PRICED IN 46 CITIES OUT OF 56. 2/ PRICED IN 47 CITIES OUT OF 56.			

1/ PRICED IN 46 CITIES OUT OF 56.

2/ PRICED IN 47 CITIES OUT OF 56.



FOREIGN

International

NORTHWEST ATLANTIC FISHERIES CONVENTION

SPAIN RATIFIES CONVENTION: A Spanish decree ratifying the International Convention for the Northwest Atlantic Fisheries was published in the Official Bulletin of April 27, 1952. The instrument of Spanish ratification was deposited in Washington on January 17, 1952.

This Convention has already been ratified by Canada, Denmark, Iceland, the United Kingdom, and the United States. France, Italy, Norway, and Portugal, which are also signatories of this Convention, have not yet deposited instruments of ratification.



FOOD AND AGRICULTURE ORGANIZATION

WORLD FISHERIES--ESTIMATED ANNUAL CATCHES, 1949: The total annual output of world fisheries is not known in accurate terms, but a Food and Agriculture Organization estimate places it at about 25 million metric tons for 1949. In the FAO Yearbook of Fisheries Statistics 1948-49, this total is broken down by continents and countries. The continental breakdown is shown in table 1.

Continent	Metric Tons	Percent
Africa	600,000	2
America, North and Central ...	3,750,000	15
America, South	500,000	2
Asia (excluding U.S.S.R.)	12,000,000	48
Europe (excluding U.S.S.R.) ..	6,000,000	24
Oceania	150,000	1
U.S.S.R.	2,000,000	8
World Total	25,000,000	100

¹/IN SOME CASES STATISTICS FOR YEARS PRIOR TO 1949 ARE USED.

The ten most important fish-producing countries of the world were in order of importance in terms of catch¹ (in millions of metric tons): Japan (2.9), China (2.7), United States (2.5), U.S.S.R. (2.0), Norway (1.1), United Kingdom (1.1), Canada (0.9), Spain (0.6), India (0.5),

and the German Federal Republic (0.5). These countries with a catch of about 15 million tons account for some 60 percent of the world's total.

As far as is known, nothing has been published on a world-wide basis regarding the relative importance of the various species caught. Table 2 indicates roughly the composition of the catch by some species groups as estimated by the FAO secretariat.

There is, of course, a clear relation between capital equipment and efficiency of fishermen. The total world catch divided between 4 million fishermen leaves only about 6 tons per man. In a modern tuna clipper or trawler, or large seine boat, each

¹/IN SOME CASES STATISTICS FOR YEARS PRIOR TO 1949 ARE USED.

man produces more, while those in a dug-out canoe or without craft at all, produce well below the average. Thus, great differences in economic planning, financial remuneration, and standard of living exist among people earning their living from the sea.

Table 2 - World Fisheries--Estimated Annual Catches By Species, 1949		
Catch by Species Groups	Metric Tons	% of Total
Herring and similar species	5,200,000	21
Cod, hake, and similar species	3,400,000	14
Salmon and similar species	500,000	2
Fresh and brackish-water teleosteans	4,700,000	19
Teleostean flat fishes	600,000	2
Tunas, true mackerels, etc.	1,400,000	6
Elasmobranchs	400,000	1
Other fish species ^{1/}	6,400,000	25
Crustaceans and mollusks	2,000,000	8
Other (seaweed, etc.)	400,000	2
World Total	25,000,000	100
^{1/} MAY INCLUDE SOME QUANTITIES OF THE LISTED SPECIES GROUPS.		

On examining the external trade statistics of nearly 70 territories, accounting for almost all international trade in fisheries products, it was found that some 2 million metric tons of fishery products (product weight) enter into international trade (not accounting for whale and other aquatic mammal products). About 10 percent is accounted for by canned products; 25 percent by fresh and frozen products; 25 percent salted, dried, smoked and otherwise cured; 20 percent fish oils; 10 percent meals; and 10 percent by miscellaneous products. If the

weight of these products is converted roughly to the weight of the round fresh fish used to manufacture them, it is found that they were derived from some 5 million tons or possibly more. It can safely be stated, therefore, that some 20-30 percent of the world's fish catch passes through international trade channels.

Table 3 - Utilization of World Fisheries Production, 1949 (Estimated)		
Utilized for:	Metric Tons	% of Total
Fresh marketing	10,370,000	42
Freezing	1,070,000	4
Drying, smoking, salting, & pastes & sauces	9,820,000	39
Canning	1,290,000	5
Reduction to oils & meal ..	1,950,000	8
Other purposes	500,000	2
World Total	25,000,000	100

weight of these products is converted roughly to the weight of the round fresh fish used to manufacture them, it is found that they were derived from some 5 million tons or possibly more. It can safely be stated, therefore, that some 20-30 percent of the world's fish catch passes through international trade channels.

These figures are in many cases derived from very rough estimates; in the case of China, for example, total production in fish ponds was arrived at by relating an estimated minimum average yield per square kilometer to the total known area of fish ponds; in other cases, a conservative estimate of per capita consumption was made in relation to total population figures. As a whole, it is felt that estimates for Asia are less reliable than those for the other continents, but over-all they are considered to be fairly close to reality. It is very unlikely, therefore, that the actual world total exceeds 30 million metric tons, even if all subsistence fishing is taken into account.



Bermuda

DANISH VESSELS TO CONDUCT EXPERIMENTAL FISHING IN BERMUDA WATERS: A Danish importer who plans to fish along the Peruvian coast stopped at Bermuda en route to Peru in order to discuss with the local authorities the possibility of experimental fishing in Bermuda waters, according to the March 28 and April 3 issues of Dansk Fiskeritidende, a Danish trade paper. The local government was reported to be very much interested and it was agreed by the Danish-Peruvian Company that the two Danish cutters which recently departed from Hustedest for Peru would spend a couple months in Bermuda to determine if there is an opportunity to develop a fishery similar to that in Peru.

The vessels are equipped with a brisling seine, a tuna seine, and all kinds of trawl gear, including four floating trawls. Other types of gear are Danish seines, herring gill nets, lines of various types, and special gear (such as gill nets for bonito).



Canada

NEW NEWFOUNDLAND FILLETING PLANTS TO RECEIVE GOVERNMENT AID: A new filleting plant is being constructed at Fermeuse, Newfoundland, states a May 15 American consular dispatch from St. John's. The Newfoundland firm who is constructing the new plant is the principal motivator in another Newfoundland fishery firm. At the request of the firm, the Government has assisted this latter company in acquiring two draggers by relinquishing a mortgage held on the firm's property at Harbour Grace. In addition, the Government is guaranteeing a loan of C\$350,000 to assist in the purchase of two other draggers for use at Fermeuse. On a third occasion the "Government waived the right of the repayment of principal (amounting to C\$20,000) of a loan made to the company by Commission of Government, deferring payments for a period of one year so that the company could complete plans for expansion."

The plant at Fermeuse is not yet in production, but the machinery has already been installed. It appears the plant will be of good size.

On May 7, 1952, the Newfoundland Premier announced in the Assembly that it was "likely" a new C\$600,000 fish plant will be constructed at Trepassey, on the south coast of the Avalon Peninsula. A St. John's fishery firm will build this new filleting plant providing the Government will furnish the backing.

* * * * *

SHRIMP FOUND IN NEWFOUNDLAND WATERS: The Twillingate Sun (May 3, 1952) reports that shrimp are to be found in Newfoundland waters, particularly off the east and west coasts where they were discovered a little over a year ago by the government's exploratory boat Investigator. No one yet knows the extent of the resource but an investigation undoubtedly will be made, states a May 16 American consular dispatch from St. John's.

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NEWFOUNDLAND LOBSTER FISHERY: Lobster fishermen in Newfoundland this year are having a better season than last. Prices being paid range from 22 to 24 Canadian cents per pounds, according to an April report. Inspectors are in the field checking on fishermen to see that new regulations respecting minimum-size lobsters are obeyed.

* * * * *

NEWFOUNDLAND SALT-FISH SALES TO EUROPE TO BE HANDLED IN DOLLARS: With news from Ottawa that Newfoundland's salt-fish sales to Europe henceforth must be handled in Canadian dollars and not sterling, an end came to the financial device which played a very useful part in supporting the Island's economy following World War II, and which permitted Newfoundland to sell to countries relatively rich in sterling but poor in dollars. With Newfoundland's national debt largely in sterling debentures, it was happily possible to figure in British currency. Apparently customers are able to pay in dollars this year; in any case, negotiations must be conducted on this basis.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, OCTOBER 1951, P. 24.

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NEWFOUNDLAND HOPES FOR HIGH OUTPUT OF SEAL OIL: Following a successful year of sealing in 1951, when some 620,000 gallons of seal oil were produced (or 60 per cent more than in 1950), a slightly greater number of sealing vessels from Newfoundland started out for the sealing grounds early in March this year, according to an American consular dispatch from St. John's. In addition to the 14 Newfoundland vessels, carrying some 700 men, there were 11 Norwegian and one French craft scheduled to operate in the seal fishery.



Most of the Newfoundland sealers were to go to the so-called "Northern Front" area along with some 3 or 4 vessels from Halifax and 2 from Norway. The Newfoundland sealing interests chartered a plane to do "spotting" from the air, a most advantageous form of assistance in hunting.

An agreement between the Canadian and Norwegian governments had been reached on March 5 as the opening date for killing seals in the Gulf, and March 10 on the Northern Front. However, a closing date had not yet been decided.

A problem which has caused some concern among Newfoundland sealing interests, and which ultimately will require settlement, is the competition from Norwegian vessels in Newfoundland waters. Newfoundland sealers contend that foreign craft should not be permitted to take seals within the 3-mile limit.

There is a real need for restrictions on the rate of killing seals in the Newfoundland area, according to officials of the Fisheries Council of Canada. It states that killings seem "definitely more than the present seal population can stand indefinitely." The kill in 1951 is estimated to have been more than twice the average number killed in 1947-50. Should it be proved after further aerial studies that the seal population is being reduced, then the need for a Canadian-Norwegian agreement to limit the annual kill would be established.

Prices for seal fat in 1952 have changed little from 1951. Last year young hoods brought C\$10.00 per hundred pounds, harps C\$9.00, bedlamers C\$5.50, and old harps and old hoods C\$4.50 per hundred pounds.

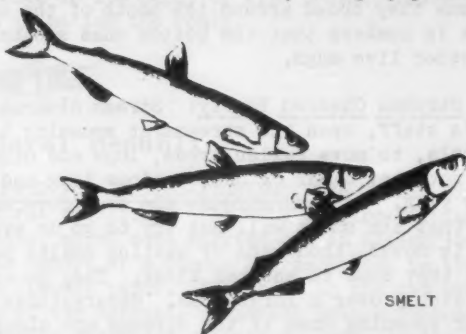
Sealing operations in 1951 were the most successful in many years. A total of about 440,000 seals was taken by ships from Newfoundland, Nova Scotia, and Norway.

Sealing activities in Newfoundland have had a hard, uphill fight for survival in recent years. Costs of outfitting sealing vessels have soared. Thus, smaller craft with less storage space and reduced living quarters have replaced the larger old-style vessels. Consequently, the crews of the newer vessels are necessarily smaller, and the carrying capacity more restricted. Moreover, crews are less eager to go out to the ice floes, preferring the more lucrative and less hazardous occupations ashore.

* * * * *

SMELT PRODUCTION DECLINES: Unfavorable weather, coupled with an apparent scarcity of fish, has caused a sharp decline in the catches of smelt, a highly prized food fish landed by Canadian Atlantic coast fishermen, reports the March 1952 Trade News of the Canadian Fisheries Department.

For the period from September 1951 to February 1952 smelt production in the Maritime area reached only 3,637,000 pounds, with a value of C\$623,000. This was only about half the catch made during the same period of 1950 and 1951, when 7,847,000 pounds were taken, with a landed value of C\$1,027,950. Prices have been higher this season, the average being C\$17.15 per hundred pounds. The previous season's price for the same period was C\$13.10 per hundred pounds.



The drop in smelt catches is particularly significant in New Brunswick. For the September-February period just past, smelt catches in New Brunswick totaled only 2,146,000 pounds, compared to 4,865,000 pounds for the same period last season.

Smelt catches of commercial size are made in many Maritime centers. However, the major portion comes from the New Brunswick counties of Northumberland and Kent, with the estuary of the Miramichi River in northeastern New Brunswick providing one-third of the annual Canadian catch. The commercial fishery is carried on mainly in the winter by means of box nets and bag nets set under the ice. In other districts some fishing is also done with gill nets.

Types of Gear: On the Miramichi, the type of gear most widely used is a double-ended box net and a net called a "double-double" box net. The last named apparatus is a box net with four leaders instead of one, developed by the fishermen in the last few years. It is an efficient trap, capturing the smelt from whatever direction they come. Bag nets are used in the early part of the season, starting the first of December, in the main Miramichi River. This is a deep-water operation and has been a failure in the past few years because of too much ice.

In Newfoundland and Labrador the smelt is of little commercial importance. The small fishery there has been confined to the Port au Port Bay and St. Georges Bay areas of the southwest coast of Newfoundland. Prior to 1939, there was a small commercial fishery at the northern tip of Newfoundland.

Distributed from Labrador to New Jersey, smelt are abundant in the Gulf of St. Lawrence and off New Brunswick, Prince Edward Island, and Nova Scotia. They live in bays and harbors in open water rather than on the bottom. Some lakes contain a "land-locked" variety.

Smelt move into estuaries from the open sea each autumn and remain there during the winter. After the spring "breakup" they run into the coastal streams to spawn in the fresh and brackish water.

The Miramichi smelt fishery has been studied by the Fisheries Research Board of Canada to determine means of increasing smelt production. These studies have been conducted by the Board's biological station at St. Andrews, N. B. Scientists at this station have sought to bring about a greater yield by the improvement of conditions for reproduction and by sound regulation of the fishery. Their observations and experiments showed that the smelts that come to the Miramichi to spawn find sometimes that the streams are impassable because of obstructions. When this happens they crowd around the mouth of the stream and spawn there. The eggs are so thick in numbers that the bottom ones smother and rot, with serious effects on all the other live eggs.

Streams Checked Yearly: Stream clearance crews, under direction of the station's staff, open the streams at spawning time, using saws, axes, peavies, and other tools, to move fallen trees, logs and other debris in the channels. A stream does not stay clear of obstructions long and the crews have to look at all streams every year. In some streams the area covered amounts to about two miles. The crews find that the smelt will not try to go up even a small waterfall. When an obstruction is moved, thousands of waiting smelts pour through the opening, moving upstream until they come to another block. They go as far as they can, thus spreading the eggs evenly over a large area. Observations show that the smelts make use of a much larger spawning area if the streams are cleared and that eggs are less crowded and hatch better.

The smelt, capelin, and silverside (small, slender, silvery fishes which occur in Canadian Atlantic waters) are three distinct marine species yet look so much alike that some fishermen and many of the general public confuse them. Even in the adult stage, smelt and capelin may often be confused and the silverside, particularly in the young stages, has frequently been mistaken for a young smelt or a capelin.

The smelt is translucent olive-green on the back, paler on the sides, and has a silvery belly. It is from four to nine inches long when taken commercially, with an occasional 12-inch fish entering the catch.



Formosa

FISHERIES PRODUCTION GOAL FOR 1952: The Provincial Government of Formosa set the fisheries production (sea catch and fish culture) goal for 1952 at 148,829 metric tons--51,852 metric tons more than the 1951 production.

The Government plans to obtain Japanese technical cooperation as a means to increase fisheries production, states an American consular dispatch from Taipei dated April 29.



France

FISHING REELS EXPORTED TO UNITED STATES: Special fishing reels are being manufactured at Cluses, Haute-Savoie, France, solely for export to the United States, where a ready market has been found, according to a May 12 American consular dispatch from Lyon. The value of these exports has risen from almost nothing in 1949 and 1950 to \$130,807 in 1951 and \$115,000 during the first four months of 1952.

The French firm manufacturing these reels states that they are unable to fill all the orders and that they are currently 30,000 units behind. The firm produces approximately 5,000 reels per month, which is its capacity with present facilities. Sixty of its 250 employees are engaged in making the reels.



German Federal Republic

FIRST TESTS OF GERMAN VESSEL EQUIPPED FOR ELECTRO-FISHING: The German experimental fishing vessel R-96 made the first practical tests with electro-fishing in salt water from April 8 to 10. The tests, which were carried out in Kielerfjord, were quite successful, according to the report of a German correspondent in the April 23 issue of Fiskaren, a Norwegian fishery paper. Both herring and cod were drawn, as if magnetized, to the source of the current. Repeated trials demonstrated that it was possible to assemble widely dispersed schools and even single fish in front of the trawl opening. Cod reacted at a greater distance from the source of the current than herring because of their greater body surface. By using the correct current, small and young fish can be excluded from the magnetic influence of the electrodes so that one can, from the bridge of the vessel, literally sort out the catch according to size and kind before the trawl catches them.

Dr. Meyer stated that these trials have shown the utility of Dr. Kreutzer's method for electro-fishing in the open ocean.

Manufacture of an electro-trawl has begun and it is expected that the gear can be tested in Kieler Bay within a couple of months.

EDITOR'S NOTE: DR. KONRAD KREUTZER IS A GERMAN PHYSICIST WHO DEVELOPED HIS INVENTION THROUGH EARLIER WORK ON AN ELECTRO-SHOCK APPARATUS. DR. P. F. MEYER IS ON THE STAFF OF A FISHERIES INSTITUTE IN HAMBURG. A DESCRIPTION OF DR. KREUTZER'S EARLIER ELECTRO-FISHING EXPERIMENTS IS INCLUDED IN FISHERY LEAFLET 348, WHICH MAY BE OBTAINED FREE FROM THE DIVISION OF INFORMATION, U.S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D.C.

GERMAN VIEW ON BRITISH-NORWEGIAN FISHERY DISPUTE: With respect to the World Court decision favoring Norway in the British-Norwegian dispute regarding territorial waters, the Association of German High Sea Fisheries announced that the German fisheries shared the British view that on all coasts only a zone of three nautical miles should be recognized as territorial water, states a March 31 American consular report from Bremerhaven. The Association claims to have supported England in the dispute by the submission of material even though Germany was not directly involved. The German fishing industry fears other Scandinavian countries, particularly Iceland, may follow Norway's example.

REVIEW OF THE FISHERIES, 1951: Fishing Fleet Strength, 1951: TRAWLER FLEET: The West German trawler fleet decreased from 230 vessels on January 1, 1951, to 223 on December 31, but increased in tonnage from 93,241 to 96,627 gross metric tons in the same period, according to a March 31 American consular report from Bremerhaven.

During 1951, 13 trawlers were built, 7 were bought from abroad, 2 were lost at sea, and 25 were scrapped. The modernization of the trawler fleet is reflected in the fact that the average age of the ships decreased from 13.7 years on January 1 to 11.6 years on December 31. At the end of the year, German shipyards had orders for approximately 20 new trawlers for the West German fishing industry, ranging from 400 to 600 gross tons.



PORT OF BREMERHAVEN SHOWING FISHING VESSELS IN PORT.

LUGGER FLEET: The German lugger fleet increased by 2 vessels in the period from January 1 to December 31, 1951. The tonnage increased from 18,716 to 19,651 gross tons in the same period.

Herring Season in 1951 Shifted to Later in the Year: The outstanding feature of the 1951 herring season for the West German fisheries was the apparent shifting of the season to a later time of the year.

While the trawl herring catch in July 1951 (the first month of the herring season) was less than in 1949 or 1950, the herring production of German trawlers in November 1951 was more than double that of the previous November. The peak month of herring production, usually September, came in 1951 in October with a catch of 76,817 metric tons caught by all types of vessels combined.

The 1951 herring season was particularly successful for the West German fisheries because the high prices for fats and oils enabled the fish meal and oil factories to pay relatively high prices (Dm 256 or about US\$60 per metric ton) for the herring that was not used for human consumption.

Retail Prices for Fishery Products: The following are some retail prices for fishery products reported in Bremen and Bremerhaven:

Retail Prices of Certain Fishery Products in the German Federal Republic
(4th Quarter 1951)

Product	P r i c e	
	DM/	U.S.\$
	Per kilo	Per lb.
Cod, round, heads off	1.3	.14
Haddock, round .....	.83-1.80	.09-.20
Halibut, fillets, iced	3.90	.42
Herring:		
Pickled, boned, canned	2.33	.25
Pickled, heads off, canned	2.20	.24
Fried, pickled, heads off, canned	2.00	.22
Pickled, heads off (originally sea-salted)	1.60	.17
Round .....	.59-.70	.06-.08
Pollock (coalfish):		
Smoked, salted, artificially colored to resemble smoked salmon, sliced, in oil, canned	5.47-6.80	.59-.74
Round, heads off .....	.55-1.27	.06-.14
Rosefish (ocean perch):		
Smoked	2.37-2.60	.25-.28
Fillets, iced	2.00-2.10	.22-.23
Round, heads off .....	.82-1.40	.09-.15

1/ONE DEUTSCHE MARK EQUALS 23.81 U.S. CENTS.

Wholesale Prices for Fishery Products: The following are some wholesale prices for fishery products reported in Bremerhaven:

Wholesale Prices of Certain Fishery Products in the German Federal Republic
(4th Quarter 1951)

Product	P r i c e	
	DM/	U.S.\$
	Per kilo	Per lb.
Cod, round .....	.50	.05
Haddock, round .....	.63	.07
Herring, round .....	.27	.03
Pollock (coalfish), round .....	.56	.06
Rosefish (ocean perch), round .....	.52	.05

1/ONE DEUTSCHE MARK EQUALS 23.81 U.S. CENTS.

Marketing and Foreign Trade in Fishery Products, 1951: The disposal of West Germany's catch of fishery products in 1951 was facilitated by the high prices paid by the fish meal factories, the decrease in imports, and the increased per-capita consumption of fish.

The average per-capita consumption of fishery products in West Germany in 1951 was about 27.7 pounds of which 22.7 pounds came from German production and 5.0 pounds from imports. The 1950 average per-capita consumption was 24.2 pounds of which 19.4 pounds came from German production and 4.7 pounds from imports. The increased fish consumption was considered due to the increased prices for other foodstuffs, especially meat.

A certain burden was put on the market by the ending of interzonal trade on November 30, 1951, as the West German fishing industry was said to have been setting

aside about 10 percent of its production for deliveries to the Soviet Zone. This fish was not all thrown onto the market immediately, however, as most of it was kept in storage in anticipation of a re-opening of interzonal trade under a barter arrangement.

The main characteristic of the German export trade in fish in the latter part of 1951 was the development of connections with countries not previously supplied by German firms and the growth of a considerable transit trade, in which German firms supplied African and South European markets with dried cod from Norway and Iceland.

Government Measures Affecting Fisheries: The German change-over to an ad-valorem tariff system, which became effective on October 1, 1951, required renegotiation of some trade agreements.

The new 30 percent ad-valorem duty on sardine imports, for example, which are mainly supplied by Portugal and Morocco (now participants in GATT) was expected to be reduced by 14 percent in the new German-Portuguese trade agreement.

The Law for Investment Aid was passed by the German Federal Parliament on December 7, 1951, with an amendment sponsored by the Deutsche Partei exempting the high seas, coastal, and inland fisheries from compulsory contributions to the investment fund.

Germany (Russian Zone)

FISH-PRODUCTION CAPACITY INCREASED: The Eastern Zone of Germany is increasing its capacity for catching and processing fish, according to a German fisheries newspaper, reports the May 24 Canadian Foreign Trade. In the first three months of 1952, four 1,000-metric ton trawlers were completed. In addition, the first fish-meal factory, which is also equipped to produce industrial oils, is in production.

* * * * *

INCREASED FISHERIES PRODUCTION INCLUDED IN NEW PLAN: The new Five-Year Plan of the East German government calls for a 500 percent increase in fish production from 1951 to 1955, according to a March 31 American consular report from Bremerhaven. The fishing industry stands in sixth place in the Plan in regard to the planned increases. Fish-processing capacity is to be increased by 81,500 metric tons annually, and two new fishery trusts are to be set up.

The West German trade journal Allgemeine Fischwirtschaftszeitung, however, estimates the maximum Soviet Zone fish production capacity for 1952 at not more than 30,000 to 32,000 metric tons. In order to raise the estimated present German Soviet Zone annual per-capita fish consumption of 13.2 pounds to the West German level of 26.4 pounds, it is calculated that the Soviet Zone would need an annual supply of 230,000 metric tons of fish.



Japan

EXPORT BAN ON HERRING OILS LIFTED: The ban on exports of sardine and herring oils by Japanese exporters has been lifted. This new order by the Japanese Ministry of International Trade became effective April 1, 1952.

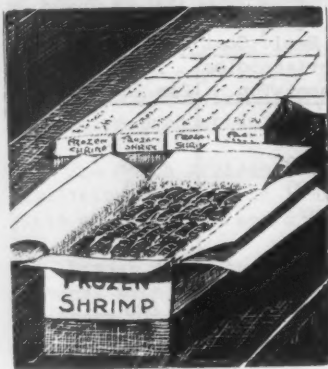
It is expected that Japan will export 3,000 metric tons of these oils in the coming fiscal year.



Mexico

GUAYMAS SHRIMP FISHING SEASON ALMOST OVER: Because of the closed season for shrimp placed in effect on March 8, the bays and coastal waters of the Gulf of California, Sinaloa, and Nayarit have been cleared of shrimpers for a month, states an April 4 American consular report from Guaymas.

About two thirds of the Guaymas-based fleet was tied up for maintenance and repairs during the period, while the other third (about fifty boats) left to continue fishing in the Salina Cruz area and on the western coast of Guatemala.



After processing the shrimp landed, the shrimp-freezing plants in Guaymas shut down when the closed season began. The largest of the local plants paid off all employees except a skeletal office and maintenance force until next October. Two others closed in February. It seems doubtful that more than four plants will open for the remaining months of this season. Some intend to open for a trial period and will probably close again after a few weeks. Not more than two are expected to operate until the end of the season.

The total quantity of shrimp delivered in Guaymas in the first five months of the season (Oct.-Feb.) was only 2,520 tons, while the average for the same period in the three previous seasons was more than 3,700 tons.

Fishermen and freezing-plant owners are generally optimistic about the prospects for the 1952-53 shrimping season but expect the industry will have further serious financial difficulties and will undergo some consolidation and reorganization before October.



Norway

HERRING PRESERVATIVE METHOD DEVELOPED: A new preserving method has been developed which is expected to add to the value of Norway's herring catch by keeping the fish as good as fresh at least three months, states the Norwegian Information Service in a May 22 news release. The new method has been developed by R. Perry Howden of Aalesund.

At a recent demonstration, a variety of dishes made from herring preserved three months earlier according to the new method were served. All agreed that the herring tasted as if it were fresh.

The herring had been packed in barrels under public control. The barrels were then sealed and kept under lock and key at the Customs Office. To eliminate any chance of fraud, a public herring inspector was present when they were opened. Analysis by a chemist from the State Cod Liver Oil Control Service showed the 3-month herring to contain 12.35 percent of fat. Oil pressed and clarified from boiled herring revealed fat acids of only 2.16 percent. The exceptionally low acid content is of special importance in the processing of herring oil.

Industry representatives and herring experts alike were reported most enthusiastic about the sensational preserving method, which they predicted would open new prospects for the storage of herring, both for eating and for processing.

Peru

NEW CANNED FISH BASIC COST PRICES FOR EXPORT TAXES: New basic cost prices have been established for canned fishery products. These prices are to be used in determining export taxes. A Supreme Resolution was issued on November 9 establishing the new basic prices, which were based on a study of the costs of production of canned fish made by the Peruvian Ministry of Agriculture, states a release from Lima.

The following basic cost prices are established for a short ton of 907.184 kilograms (about 2,000 pounds) in fixing export taxes on canned fish (canned tuna, bonito, and others):

Item	Size of Can	Basic Cost Price	
		In Peruvian Soles Per Short Ton	In US\$ Per Short Ton
<u>Canned Fish:</u>			
<u>In Oil:</u>			
Solid pack	7 oz. can	9,238	605
Flakes and grated	6½ " "	9,220	603
Flakes and grated	6 " "	9,892	647
<u>Natural Style (Brine Pack):</u>			
Solid pack and flakes	16 oz. can	5,217	341
Solid pack and flakes	7 " "	8,025	525
<u>In Tomato Sauce:</u>			
"Partala style" (Calif. sardine style)	16 oz. can	6,322	414

For products with weights per can greater than those specified, a basic cost price of 9,238 soles (US\$605) per short ton is established for oil packs and 5,217 soles (US\$341) for natural-style packs. On the other hand, products with weights per can less than those fixed above are assimilated into the nearest class, type, and weight.

NOTE: VALUES CONVERTED ON THE BASIS OF 15.28 SOLES EQUAL US\$1.00.



Union of South Africa

PILCHARD PRODUCTION INCREASED IN 1951: The South African pilchard industry registered a phenomenal gain in production during 1951, according to a March 21 American consular report from Cape Town.

Production of fish meal reached 55,000 short tons as compared to 28,000 short tons in 1950 and fish body oil production reached 15,500 tons as compared to 14,500 in 1950. Output of canned pilchards also rose sharply, reaching an estimated 500,000 cases (48 1-lb. cans per case) in 1951.

* * * * *

TRAWLER CATCH, 1951: The Union of South Africa's trawled fish catch in 1951 was 124,774,123 pounds (excluding offal), with a value of about US\$4,005,716 to the fishermen. These are official statistics compiled by the Division of Fisheries of the Department of Commerce and Industries as reported by an American consular dispatch from Capetown dated May 6. The 1951 trawler catch was 21 percent greater in quantity and was worth 13 percent more.

Declining foreign markets coupled with an increase in domestic fish prices announced in April 1952 are expected to prevent any further increase in the trawler catch during the current year.

* * * * *

WHALING INDUSTRY, 1950-51: During the 1950-51 antarctic season the expedition of the Union Whaling Company of Durban, consisting of the factoryship Abraham Larsen and eleven catchers, caught a total of 2,048 whales (1,315.9 blue-whale units) from which were produced 161,900 barrels or about 27,000 long tons of whale and sperm oil and about 2,600 tons of meat meal and liver flakes, a March 21 American consular report from Cape Town states. The British Ministry of Food purchased the entire production. The price paid for whale oil was £100 (US\$278) per longton.



The South African company accounted for the greatest production of all the 19 expeditions. When the limit of 16,000 blue-whale units had been caught, the total yield of whale and sperm oil was slightly over 2,100,000 barrels.

Durban shore-based operations during 1951 were the best in the history of the company, with some 2,112 whales caught yielding a total of 12,112 long tons of whale and sperm oil. The bulk of the whale oil production was sold locally at £95 (US\$264) per long ton and the rest was exported at somewhat higher prices.



CANNED CRAB INDUSTRY OF JAPAN

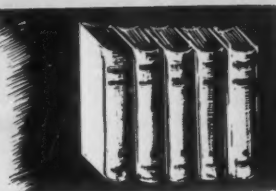
The Japanese technique of catching crabs has changed little during the history of the industry. Tangle nets with a stretched mesh of not less than 18 inches have been used exclusively in the fishery. These nets were set in a long series and left for an indeterminate length of time depending on weather conditions.

Although hand labor was used by Japanese in preparing the crabs, the entire process was placed upon an assembly-line basis both in the land-based canneries and aboard the factory ships, and speed, efficiency, and complete utilization of material were achieved. The actual canning process was the same in factory ships and in land-based canneries.

--Fishery Leaflet 314



FEDERAL ACTIONS



Department of Commerce

NATIONAL PRODUCTION AUTHORITY

SCARCE MATERIALS LIST REVISED: Removal of more than a score of items from NPA's Designation 1 (Formerly NPA Notice 1) list of scarce materials, which are subject to anti-hoarding controls of the Defense Production Act, was announced June 5 by the National Production Authority.

This action makes the list current by reflecting changes in the supply-demand situation of materials since November 1951--date of the last amendment of the order. The revised list now conforms with NPA regulations and orders relating to inventory control. A number of items, currently in short supply, have been added to the list, but none is of particular interest to the fishery industries. Among the materials removed from Designation 1 of interest are lead (all forms) and nylon plastic type.

The following are some of the materials listed in Designation 1 of particular interest to the fishery and allied industries:

LIST A - DESIGNATION OF SCARCE MATERIALS

* ITEMS PRECEDED BY ASTERISK HAVE BEEN ADDED OR ARE CHANGES IN THEIR DESCRIPTION SINCE ISSUANCE OF NPA NOTICE 1, AS AMENDED NOVEMBER 7, 1951.

CHEMICALS

CHLORINE, GASEOUS AND LIQUID
FREON
SULFURIC ACID

MISCELLANEOUS

ALUMINUM FOIL, CONVERTED
CANS
*CELLOPHANE
CONTAINERS AND FABRICATED PRODUCTS MADE WHOLLY OR PARTLY FROM ALUMINUM FOIL.
*CONTAINERS, OTHER SHIPPING CONTAINERS, PACKAGES AND PACKAGING MATERIAL, EXCEPT GLASS CONTAINERS.
DRUMS, STEEL, SHIPPING
REELS AND SPOOLS, SHIPPING AND PACKAGE (WHOLLY OR IN PART OF METAL).
TEXTILE BAGS
UNIT PACKAGES, WRAPPERS, AND SHIPPING CONTAINERS OF ALL TYPES MADE WHOLLY OR PARTLY FROM ANY OF THE FOLLOWING FILMS AND PLASTICS:
CELLOPHANE, CELLULOSE ACETATE, CELLULOSE ACETATE BUTYRATE, ETHYL CELLULOSE, ETC.

In addition to the above, the list contains a large number of metals, minerals, and chemicals.

For details see: DSM-1 (Designation of Scarce Materials and Withdrawal of Previous Designation), dated June 5, 1952; News Release NPA-2293.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW DECEMBER 1951, PP. 31-2.

FULL TEXTS OF MATERIALS ORDERS MAY BE OBTAINED FROM NATIONAL PRODUCTION AUTHORITY, WASHINGTON 25, D. C., OR FROM ANY DEPARTMENT OF COMMERCE REGIONAL OR FIELD OFFICE.

Economic Stabilization Agency

OFFICE OF PRICE STABILIZATION

CANNED MAINE SOFT-SHELL CLAMS EXEMPTED FROM PRICE CONTROL: Canned Maine whole soft-shell clams were exempted from price control by the Office of Price Stabilization on April 7.

The exemption was granted by Amendment 14 to General Overriding Regulation 7 and became effective April 12.

OPS said the raw clams are not subject to control. Exemption of the canned product, which constitutes only about seven percent of the annual catch, will have little or no effect on the cost of living or other costs, and continuation of control would involve administrative burdens out of proportion to the benefits to be gained.

Canned soft-shell clams are packed only in Maine.

The full text of Amendment 14 to General Overriding Regulation 7 follows:

GOR 7—EXEMPTION OF CERTAIN FOOD AND RESTAURANT COMMODITIES

CANNED MAINE WHOLE SOFT SHELL CLAMS

Pursuant to the Defense Production Act of 1950, as amended, Executive Order 10161, and Economic Stabilization Agency General Order No. 2, this Amendment 14 to General Overriding Regulation 7 is hereby issued.

STATEMENT OF CONSIDERATIONS

This amendment to General Overriding Regulation (GOR) 7 exempts canned Maine whole soft shell clams from price control.

Canned whole soft shell clams are packed only in Maine. The raw clams are not now subject to price control. The canned clams are under Ceiling Price Regulation (CPR) 22 at the processor level, and under the General Ceiling Price Regulation (GCPR) at wholesale and retail.

The supply of raw Maine soft shell clams is constantly diminishing. The present annual catch is some 11,000,000 pounds. About 800,000 pounds, or 45,000 cases, are now being canned. This is only slightly more than 7 percent of the catch and is valued, in the aggregate, at less than \$1,000,000.

The exemption of canned Maine whole soft shell clams will have little or no effect upon the cost of living, the cost of the defense effort, or the general current of industrial costs. Furthermore, price control of these clams involves an administrative burden out of all proportion to the importance of maintaining control.

In formulating this amendment, the Director of Price Stabilization has consulted with industry representatives, including trade association representatives, to the extent practicable and has given full consideration to their recommendations. In his judgment, the ex-

emption provided for by this amendment will not defeat or impair the price stabilization program or the objectives of the Defense Production Act of 1950, as amended.

AMENDATORY PROVISIONS

General Overriding Regulation 7 is amended by adding a new section to read as follows:

SEC. 15. *Canned Maine whole soft shell clams.* No ceiling price regulation heretofore issued or which may hereafter be issued by the Office of Price Stabilization shall apply to sales of canned Maine whole soft shell clams.

(Sec. 704, 64 Stat. 916, as amended; 50 U. S. C. App. Sup. 2154)

Effective date: This amendment is effective April 12, 1952.

ELLIS ARNALL,
Director of Price Stabilization.

* * * * *

ROLLBACKS OF PRICE CEILINGS ON CERTAIN OILS RESCINDED: The rollbacks of price ceilings on crude soybean oil, crude cottonseed oil, crude corn oil, and lard, which were suspended on April 28, were rescinded by OPS. The ceilings in effect before the suspension were restored and became the suspended ceilings.

The move is in line with the Price Stabilizer's policy that suspensions of price ceilings are not to be coupled with adjustment of the suspended ceilings, either upward or downward.

The suspended ceilings on the three vegetable oils and lard were lower than the ceilings previously in effect. These lower ceilings were rescinded by Amendment 14 to Ceiling Price Regulation 6, fats and oils, which re-established the ceilings at this former level.

Both the restored ceilings and the rescinded ceilings are considerably higher than current market prices.

The Price Stabilizer announced his intention to reimpose ceiling prices on the three oils and lard, if and when their market prices rise to within 2½ cents of the suspended ceiling prices. This recontrol "trigger" corresponds to that which was provided in Amendment 13 for the rescinded ceilings.

For details see: Amdt. 14 (Crude Soybean Oil, Crude Cottonseed Oil, Crude Corn Oil, Lard, Rescission of Rollback of Ceiling Prices) dated May 19, 1952, to CPR 6 (Fats and Oils); and news release No. OPS-O-882.

* * * * *

MEANING OF "F.O.B. PORT-OF-ENTRY" FOR MARINE FEED PRODUCTS CEILING PRICES:

An interpretation of the meaning of "f.o.b. port-of-entry" in establishing ceiling prices on certain marine feed products sold by importers and distributors was issued by the Office of Price Stabilization on June 5. The text of this interpretation (Int. 1 to CPR 39) follows:

CPR 39—CEILING PRICES ON CERTAIN MARINE FEED PRODUCTS SOLD BY PROCESSORS, IMPORTERS AND DISTRIBUTORS

INT. 1—MEANING OF F. O. B. PORT OF ENTRY (SECTION 4 (a) AND (b))

An importer of fish meal situated at an Atlantic, Gulf or Pacific coastal point, or in the Territory of Hawaii, cannot, under sections 4 (a) or (b) of Ceiling Price Regulation 39, as amended, sell his meal at the applicable ceiling prices set forth in Table A of the regulation on an

f. o. b. incoming vessel basis. The general rule of establishing ceiling prices under the regulation is that an applicable f. o. b. ceiling price applies to a shipment of fish meal when that shipment is loaded to the means of conveyance by which it is transported to the buyer's destination. Accordingly, f. o. b. port-of-entry means free on board rail cars, barges or other means of conveyance used in transporting the lot of imported fish meal from the port of entry

to the buyer's destination. Any costs involved in landing and unloading the lot of imported fish meal and in loading that lot to cars or barges by which it is transported from the port of entry must be absorbed by the importer.

(Sec. 704, 64 Stat. 816, as amended; 50 U. S. C. App. Sup. 2154)

HERBERT N. MALETZ,
Chief Counsel,
Office of Price Stabilization.

NOTE: FULL TEXTS OF PRICE ORDERS MAY BE OBTAINED FROM THE OFFICE OF PRICE STABILIZATION, WASHINGTON 25, D. C., OR FROM THE REGIONAL OPS OFFICE IN YOUR AREA.



Department of the Interior

DEFENSE FISHERIES ADMINISTRATION

NEW DEPUTY ADMINISTRATOR DESIGNATED: Andrew W. Anderson, Chief of the Fish and Wildlife Service's Branch of Commercial Fisheries, was designated as Deputy Administrator of the Defense Fisheries Administration by the Secretary of the Interior on June 11.



Anderson will assume these new duties in addition to his present assignment for the duration of the DFA program. Milton C. James, who retired as Assistant Director of the Service on March 31, served as DFA Deputy Administrator from its formation until his retirement.

Under a reorganization of DFA effected in December 1951, Anderson took on additional duties as Chief of the Office of Operations in the defense fisheries organization and assumed responsibility for much of DFA's functional activities.

Anderson has had long and varied experience in both commercial fishing and in Federal fisheries work. A graduate of the College of Fisheries of the University of Washington, he worked for eight years in the commercial fish meal and oil industry.

In 1930 he joined the Service and in 1937 was transferred to the Washington headquarters office. He organized the Service's Fishery Market News Service which, through a nationwide reporting system, keeps the industry informed on the production, shipments, sales, storage, and imports of fishery products. In August 1943 he succeeded Reginald H. Fiedler as Chief of the Branch of Commercial Fisheries.

Anderson has also served as fishery advisor on the United States delegations to the annual FAO Conferences since 1945; United States delegate representing the Department of the Interior interests at the Havana Conference which developed the constitution for ITO; and as United States delegate to the FAO Conference in Baguio which established the Indo-Pacific Fisheries Council. He is the Department of the Interior representative on the FAO Inter-Agency Committee.



Department of State

POINT 4 GENERAL AGREEMENT WITH EL SALVADOR INCLUDES FISHERIES PROGRAM: A Point 4 General Agreement between the governments of the United States and El Salvador was signed in San Salvador on April 4, 1952. There have been cooperative technical programs in operation in El Salvador for the past ten years, but the new agreement provides for their continuation and possible expansion, reports the U.S. Department of State in an April 9 news release.

Included among the programs under this agreement is one on fisheries. Investigations into the fishery resources of El Salvador are being conducted by a fisheries expert from the U. S. Fish and Wildlife Service. He also will advise the government on the modernization of the industry.

With the signature of this Point 4 General Agreement with El Salvador, there are now 33 countries with which the United States has signed general agreements.

* * * * *

IMPORT ATTITUDE: The following excerpts from a statement made by the Secretary of State with reference to the celebration of World Trade Week at a news conference held on May 21 express to some extent the Secretary's attitude regarding imports:

All of us as taxpayers are aware of the costs of our aid programs. However, that aid can be cut down if friendly foreign nations can earn their dollars by selling their products to us. As opportunities increase for our friends and allies to earn the dollars they need to buy the products they require for the common defense, their need for financial aid from the United States will decline. Our best course is to ensure that these countries are not hampered in their efforts to sell us the things they produce best.

As long as our exports exceed our imports by such large sums as they have for the last thirty-three years--totaling over 80 billion dollars--foreign countries will not be able to pay for the American goods they need.

We have three choices:

The United States can cut its exports, which would have a serious effect on the U. S. economy and create unemployment.

We can continue indefinitely to make gifts of dollars, which means the United States will never be paid for its exports and the American taxpayer will make up the difference.

Or we can allow the nations of the free world who need American products for our joint defense to sell us their products and so help earn the dollars they need to pay us. This is by far the best solution.



Eighty-Second Congress (Second Session)

MAY 1952

Listed below are public bills and resolutions introduced and referred to committees, or passed by the Eighty-Second Congress (Second Session) and signed by the President. However, the more pertinent reports, hearings, or chamber actions on some of the bills shown in this section from month to month are also listed.

BILLS AND RESOLUTIONS INTRODUCED:

Defense Production Act of 1950: H. R. 8007 (Talle) - A bill to amend the Defense Production Act of 1950, as amended; to the Committee on Banking and Currency.

Also: H. R. 8008; H. R. 8009; H. R. 8010; H. R. 8011--Same as H. R. 8007.

CHAMBER ACTIONS:

Tidelands: By a roll call of 248 yeas to 89 nays, the House adopted the Conference report on and sent to the Senate S. J. Res. 20, confirming and establishing the titles of the States to lands beneath navigable waters within State boundaries and to the natural resources within such lands and waters, and provide for the use and control of said lands and resources. (May 15, 1952)

Senate on May 29 received veto message from President on S. J. Res. 20, confirming and establishing the titles of the States to lands beneath navigable waters within State boundaries and to the natural resources within such lands and waters, and provide for the use and control of said lands and resources.

COMMITTEE MEETINGS:

Defense Production Act: Senate Committee on Banking and Currency, in executive session, ordered favorably reported with amendments S. 2594, amending and extending the Defense Production Act of 1950, as amended, and the Housing and Rent Act of 1947, as amended.

Illegal Fish Shipments: House Committee on Merchant Marine and Fisheries: Subcommittee on Fish and Wildlife Conservation approved for reporting to the full committee H. R. 5803, to prevent the shipment in interstate commerce of illegal undersized fish.

Tuna Imports: Senate Committee on Finance, in executive session, ordered favorably reported to the

Senate without amendment H. R. 5693, relating to the importation of tuna. The bill provides for a duty of 3 cents a pound on imports of fresh and frozen tuna, whether or not whole. This bill passed the House of Representatives in October 1951.

CONGRESSIONAL REPORTS:

Committee reports on bills reported in this section of interest to the fishery and allied industries (obtainable only from the committees submitting the report):

Amending the Joint Resolution of August 8, 1946, As Amended, with Respect to Appropriations Authorized for the Conduct of Investigations and Studies Thereunder (Sea Lamprey Investigations), House Rept. No. 2001 (May 27, 1952) 82d Congress, 2d Session, 4 p., printed, to accompany H. R. 6500. This bill would further amend Public Law 672, 79th Congress, approved August 8, 1946, as amended, authorizing the continuation of the investigations of the abundance and distribution of sea lampreys in the Great Lakes during fiscal year ending June 30, 1953, with the authorized limit of cost of such investigations and studies for such year being set at \$446,000. The Committee on Merchant Marine and Fisheries reported favorably upon the bill. The report states: "The committee hopes that the research phase of the program will be successfully concluded during fiscal year 1953 and suggests that a report be made to the committee early in the next Congress showing the results achieved." Included is the report of the Department of the Interior recommending enactment of the bill.

To Amend and Extend the Defense Production Act of 1950, Senate Report No. 1599 from the Committee on Banking and Currency (May 27, 1952, 82d Congress, 2d Session), 51 p., printed, to accompany S. 2594, a bill to amend and extend the Defense Production Act of 1950 and the Housing and Rent Act of 1947, and for other purposes together with the minority views of Mr. Douglas, Mr. Benton, and Mr. Moody. Committee reported favorably on the bill with amendments and recommended passage of the bill. Report includes a general statement of accomplishments and

the production job ahead. It also contains discussions of allocations and priorities, the price-stabilization program, extension of credit controls,

and the various amendments, as well as administrative recommendations.



SCHOOL LUNCH PROGRAM BUYS FISH

Fish-cookery demonstrations in the past school year influenced the eating habits of over one million students in 2,200 schools in Louisiana, Florida, Pennsylvania, New York, New Hampshire, Vermont, and Maine. These demonstrations were presented to school-lunch personnel by home economists of the U. S. Fish and Wildlife Service to encourage greater use of fish in the National School Lunch Program. The interest in fish which these demonstrations have developed in the schools presents an opportunity for fish dealers in these and other states to increase their sales.

The greatest gains in sales of fish to schools have been made by the dealers who have realized that school budgets are limited. They offered inexpensive fish requiring a minimum of preparation. They have suggested low-priced frozen fillets, such as ocean perch (rosefish), cod, haddock, and pollock to meet school needs. In canned fish, they have found sardines, tuna, and flaked cod and haddock are well accepted. These products are featured in the Service demonstrations for the same reasons that they sell well to schools.

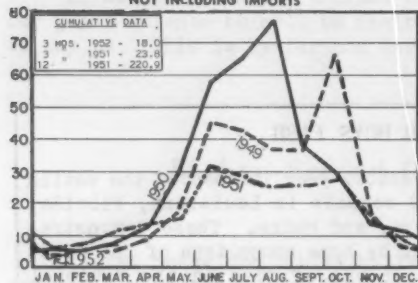
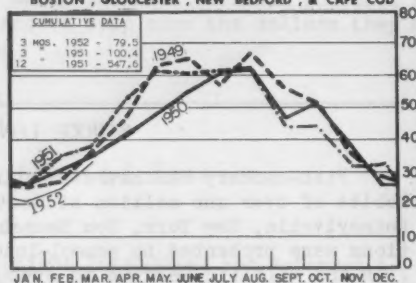
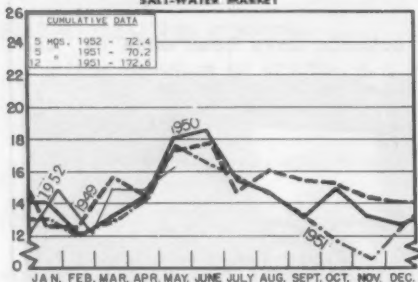
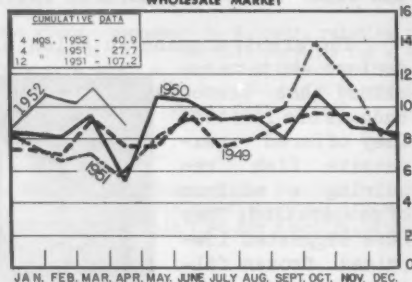
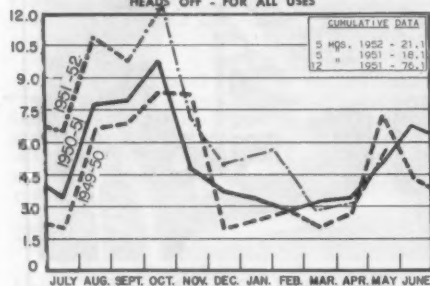
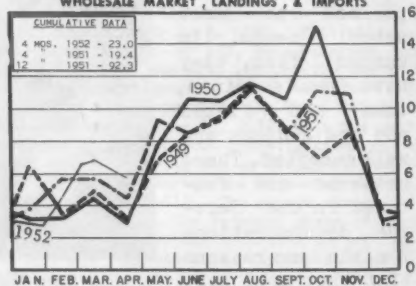


SCHOOL LUNCHROOM PERSONNEL LEARNING ABOUT FISH COOKERY FROM U.S. FISH AND WILDLIFE SERVICE PERSONNEL.

Delivery service is one of the sales points successful fish dealers are using to advantage. Dealers with established truck routes inform schools of the products they sell and the days they deliver. Some have even found it profitable to change their truck routes to deliver to more schools. The general increase in the use of fish by schools as a result of the demonstrations has been 40 to 80 percent, but by making these special efforts to serve local schools, many fish dealers have doubled or tripled their school business.

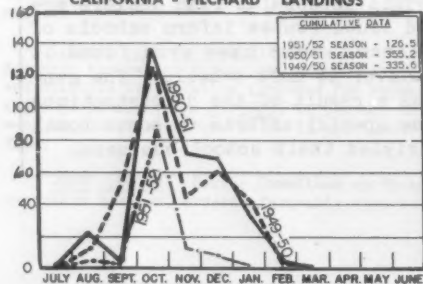
LANDINGS AND RECEIPTS

In Millions of Pounds

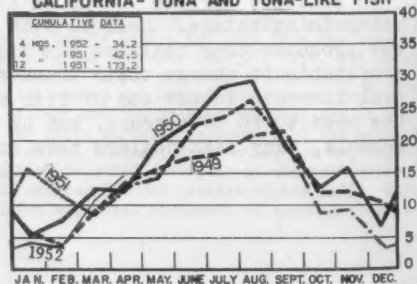
MAINE - LANDINGS
NOT INCLUDING IMPORTSMASSACHUSETTS - LANDINGS
BOSTON, GLOUCESTER, NEW BEDFORD, & CAPE CODNEW YORK CITY - RECEIPTS OF FRESH & FROZEN FISH
SALT-WATER MARKETCHICAGO - RECEIPTS OF FRESH & FROZEN FISH
WHOLESALE MARKETGULF - SHRIMP LANDINGS
HEADS OFF - FOR ALL USESSEATTLE - RECEIPTS OF FRESH & FROZEN FISH
WHOLESALE MARKET, LANDINGS, & IMPORTS

In Thousands of Tons

CALIFORNIA - PILCHARD LANDINGS



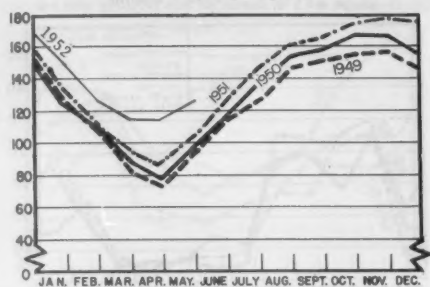
CALIFORNIA - TUNA AND TUNA-LIKE FISH



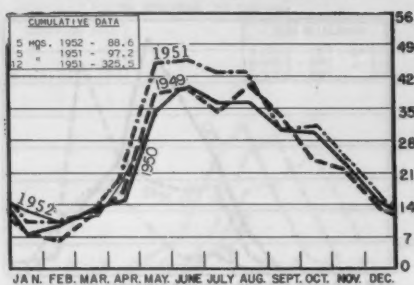
COLD STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS

In Millions of Pounds

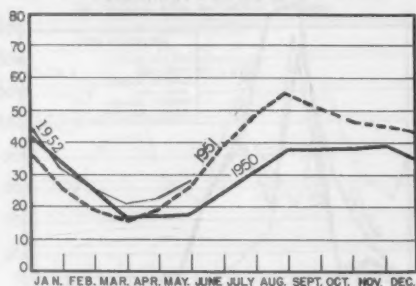
U.S. & ALASKA - HOLDINGS OF FROZEN FISH



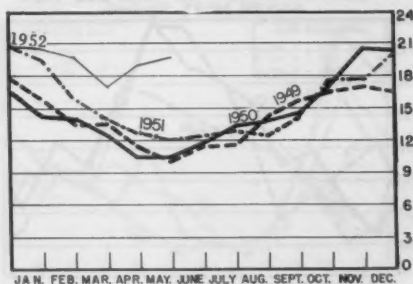
U.S. & ALASKA - FREEZINGS



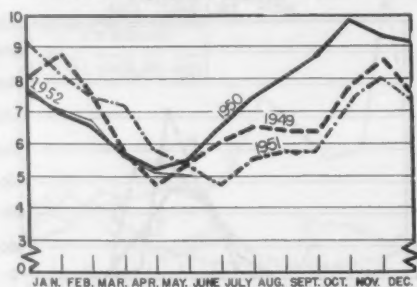
NEW ENGLAND - HOLDINGS OF FROZEN FISH



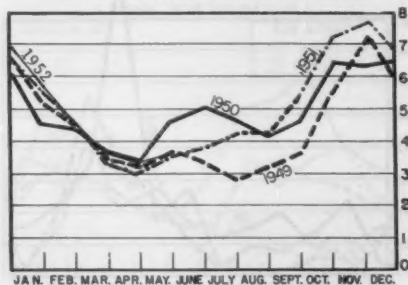
NEW YORK CITY - HOLDINGS OF FROZEN FISH



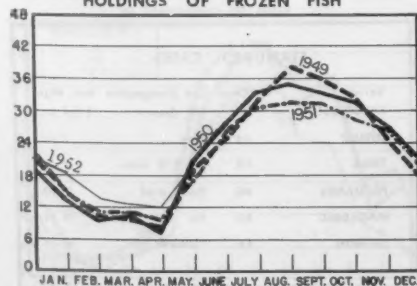
CHICAGO - HOLDINGS OF FROZEN FISH



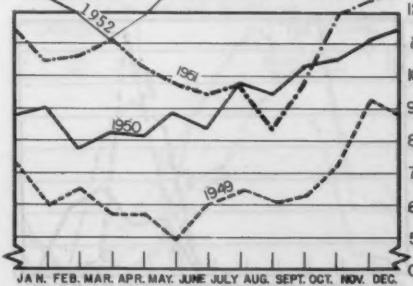
GULF - HOLDINGS OF FROZEN FISH



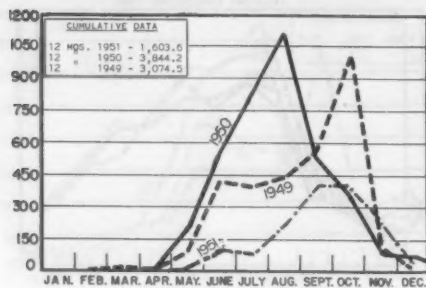
WASHINGTON, OREGON, AND ALASKA - HOLDINGS OF FROZEN FISH



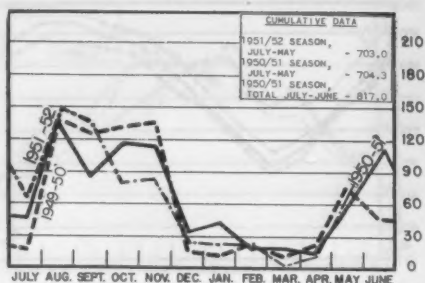
CALIFORNIA - HOLDINGS OF FROZEN FISH



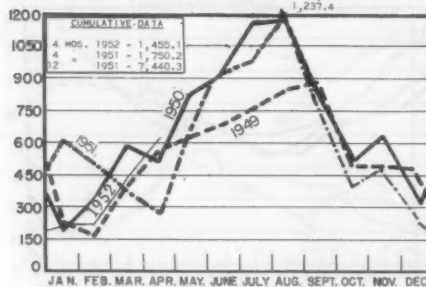
CANNED FISHERY PRODUCTS

In Thousands of Standard Cases
MAINE - SARDINES, ESTIMATED PACK

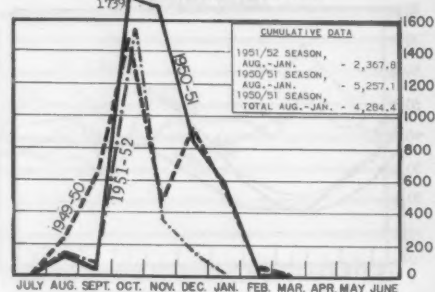
UNITED STATES - SHRIMP



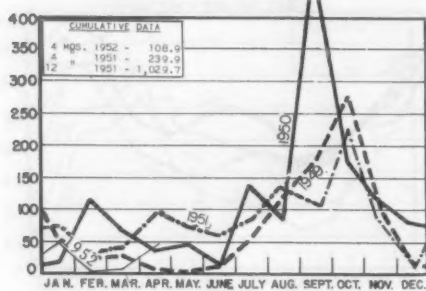
CALIFORNIA - TUNA AND TUNA-LIKE FISH



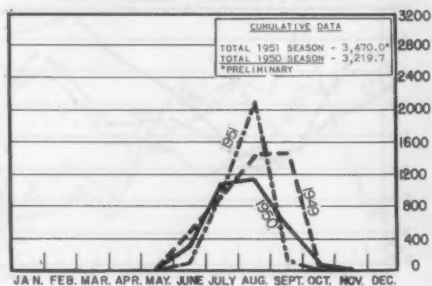
CALIFORNIA - PILCHARDS



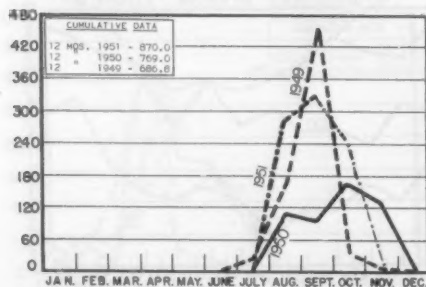
CALIFORNIA - MACKEREL



ALASKA - SALMON



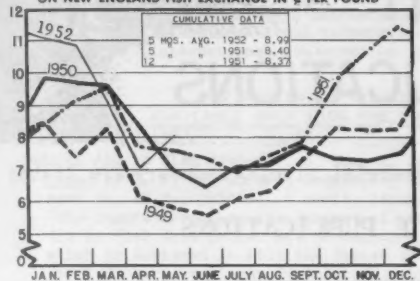
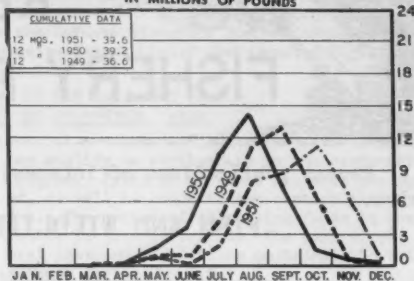
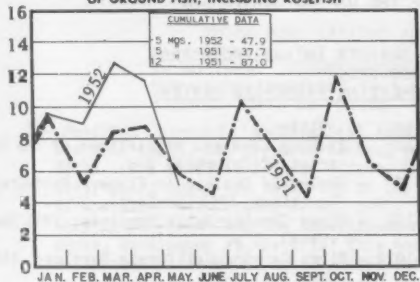
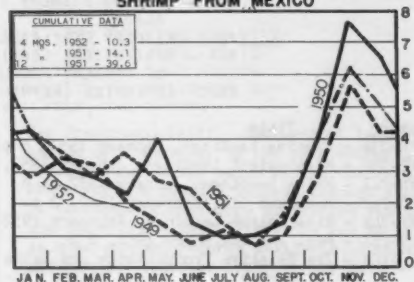
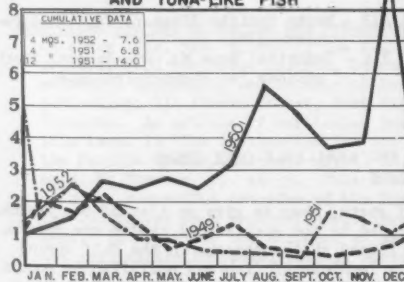
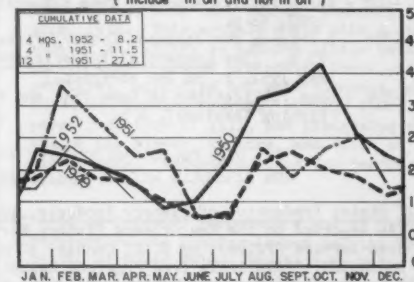
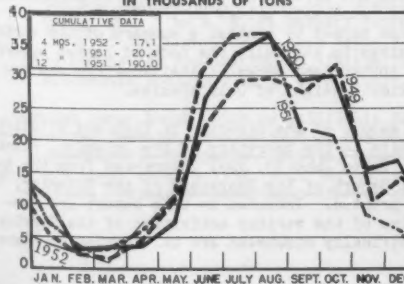
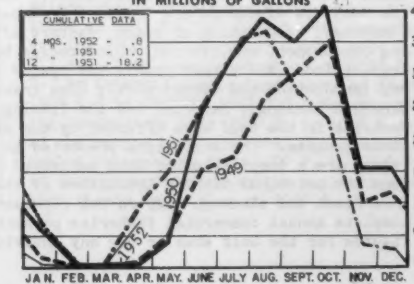
WASHINGTON - PUGET SOUND SALMON

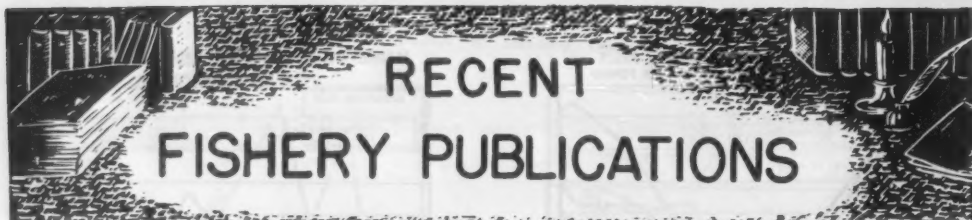


STANDARD CASES

Variety	No. Cans	Can Designation	Net. Wgt.
SARDINES	100	1/4 drawn	3 1/4 oz.
SHRIMP	48	—	7 oz.
TUNA	48	No. 1/2 tuna	7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
MACKEREL	48	No. 300	15 oz.
SALMON	48	1-pound tall	16 oz.

PRICES, IMPORTS and BY-PRODUCTS

BOSTON - WEIGHTED AVERAGE PRICE
ON NEW ENGLAND FISH EXCHANGE IN ¢ PER POUNDMAINE - IMPORTS OF FRESH SEA HERRING
IN MILLIONS OF POUNDSU.S. - IMPORTS OF FRESH & FROZEN FILLETS
OF GROUND FISH, INCLUDING ROSEFISHU.S. - IMPORTS OF FRESH AND FROZEN
SHRIMP FROM MEXICOU.S. - IMPORTS OF CANNED TUNA
AND TUNA-LIKE FISHU.S. - IMPORTS OF CANNED SARDINES
(Include in oil and not in oil)U.S. & ALASKA - PRODUCTION OF FISH MEAL
IN THOUSANDS OF TONSU.S. & ALASKA - PRODUCTION OF FISH OIL
IN MILLIONS OF GALLONS



RECENT FISHERY PUBLICATIONS

Recent publications of interest to the commercial fishing industry are listed below.

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U.S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D.C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
FL - FISHERY LEAFLETS.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-736	- Florida Landings, January 1952, 6 p.
CFS-737	- Mississippi Landings, January 1952, 2 p.
CFS-741	- Maine Landings, January 1952, 4 p.
CFS-742	- Meal and Oil, February 1952, 2 p.
CFS-745	- Mississippi Landings, February 1952, 2 p.
CFS-751	- Meal and Oil, March 1952, 2 p.
FL-108	- The Relative Productivity and Value of Fisheries of U. S. and Alaska (Revised), 10 p.
FL-362	- Sources of Information Concerning the Commercial Fisheries, 23 p.
FL-402	- North Pacific Albacore Tuna Exploration, 1950, 56 p.
FL-395	- A Program for Japanese Coastal Fisheries, 73 p. (See <u>Commercial Fisheries Review</u> , May 1952, p. 56 for abstract.)
FL-398	- Some Publications on Game-Fish and Sport Fishing (Revised), 6 p.

Number	Title
FL-403	- Fishing Laws and Regulations of the District of Columbia, 2 p.
SL-19	- Wholesale Dealers in Fishery Products, Louisiana, 1952 (Revised), 10 p.
SL-102	- Firms Canning Maine Sardines, 1951 (Revised), 1 p.
SL-102A	- Firms Canning California Sardines, 1951 (Revised), 1 p.
SL-119	- Firms Canning Squid, 1951 (Revised), 1 p.
SL-160	- Firms Manufacturing Menhaden Oil and Meal, 1951 (Revised), 2 p.
Sep. 313	- North Pacific Albacore Tuna Exploration--1951.
Sep. 314	- Technical Note No. 20--Federal Specifications for Fishery Products.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED IN THE REVIEW.

Gulf States Production of Fishery Products, 1951

(As Reported to the New Orleans Fishery Market News Service Office), by S. C. Denham, 42 p., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 314 Customhouse, 423 Canal Street, New Orleans 16, La.) This is a review of the 1951 trends and conditions in the Gulf Coast fisheries. Among the subjects discussed are the shrimp fishery (landings, composition of catch, factors affecting production, utilization, cold-storage holdings, prices, and canned pack); the oyster fishery (production and canned pack); blue crabs; fin-fish landings; imports; how the fishing industries in the Gulf were affected by the defense program. The statistics presented in this report are a compilation of data collected daily from the principal fishing localities of the Gulf Coast and although they do not represent complete annual commercial fisheries production figures for the Gulf area or for any individual

Gulf state, they do give an idea of the trends. Included in the statistical tables are data on the closed shrimp seasons in the Gulf during 1951; landings of fish and shellfish by months for certain specified localities on the west coast of Florida, and in Alabama, Mississippi, Louisiana, and Texas; crab meat production by months and areas; fishery imports at certain Gulf ports; wholesale prices on the New Orleans French Market by months; a summary of the shrimp landings in the Gulf; the pack of canned oysters and shrimp; and market classifications and approximate weight of Gulf species.

Annual Report of the Director of Fish and Wildlife Service to the Secretary of the Interior, Fiscal Year Ended June 30, 1951 (Reprinted from the Annual Report of the Secretary of the Interior, 32 p., printed. Included in this report are summaries of the various activities of the Service. Specifically discussed are utilization of fishery

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THE SPECIFIC OFFICE MENTIONED IN THE REVIEW.

resources (describes the activities of the Branch of Commercial Fisheries); administration of Alaska fisheries; Pribilof Island fur-seal industry; research in fishery biology (river, marine, and inland fisheries); maintenance of inland fisheries; international cooperation in conservation (international conservation agree-

ments and technical cooperation); Federal aid to state projects for the restoration of wildlife; river basin development and wildlife needs; administration of Federal statutes for protection of fish and wildlife; and other activities. Under the Defense Fisheries Administration section, a concise description of that agency and its functions is presented.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS
AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASH-
INGTON 25, D. C.

Federal Aid in Fish Restoration, General Informa-
tion, by R. M. Rutherford, Regulatory Announce-
ment 34, 13 p., printed, 5 cents, January 1952.
This report describes the purpose of the Federal
Aid in Fish Restoration Act of August 9, 1950,
which is designed to help the States solve their
sport-fishery problems. It tells how the states

may qualify to participate in the restoration
program. Types of suitable projects are outlin-
ed, as well as projects not contemplated by the
Act. The method of allocating funds to the
states is also described. The text of the fed-
eral laws and regulations pertaining to this Act
appears in this report.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILD-
LIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES IS-
SUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW
SHOULD BE ADDRESSED TO THE RESPECTIVE AGENCIES OR PUBLISHERS MEN-
TIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

The American Ephemeris and Nautical Almanac (For
the Year 1953), 642 p., with tables, printed,
\$3.75. The Nautical Almanac Office, United States
Observatory under the authority of the Secretary
of the Navy, Washington, D. C., 1951. (Available
only by purchase from the Superintendent of Docu-
ments, Washington 25, D. C.). This book provides
in convenient form the astronomical data required
by mariners; that is, the Greenwich hour angle and
declination of the celestial bodies used in naviga-
tion, as well as miscellaneous tables of interest
to navigators.

Australian Journal of Marine and Freshwater Research,
February 1952, vol. 3, no. 1, 104 p., illus.,
printed, 7s6d per issue (approx. 85 cents). Com-
monwealth Scientific and Industrial Research Or-
ganization, 314 Albert Street, East Melbourne, C2,
Victoria. An article of particular interest in
this issue is "The Acclimatization and Growth of
the Pacific Oyster (*Gryphaea gigas*) in Australia,"
by J. M. Thomson, pp. 64-73. This article deals
with the successful transfer of the Pacific oys-
ter (*G. gigas*) to a southern hemisphere environ-
ment. It describes the shipment of seed oysters,
the acclimatization beds, rate of survival, growth
and reproduction. Other articles in this issue
are as follows: "The New South Wales Tiger Flat-
head, *Neoplattyccephalus macrodon* (Ogilby)," by the
late W. S. Fairbridge; "Studies on the Ecology of
the New Zealand Long-Finned Eel, *Anguilla dieffen-
bachii* Gray," by A. M. R. Burnet; "A Preliminary
Study of the Limnology of Lake Hayes," by Violet
H. Jolly; "An Application of Visible Indexing to
Systematic Zoology," by I. S. R. Munro.

"Average Lunar Month Catch by California Sardine Fish-
ermen, 1949-50 and 1950-51," by Frances N. Clark
and Anita E. Daugherty, article, California Fish
and Game, January 1952, vol. 38, no. 1, pp. 85-97,
illus., printed. Department of Fish and Game,

San Francisco, Calif. This report is a contin-
uation of a summary, by the same authors, of the
average lunar month catch of the California fish-
ermen for the seasons 1932-33 through 1948-49.
It contains calculations of fishing success for
the 1949-50 and 1950-51 seasons and is presented
to make current records available to other indi-
viduals and agencies studying the sardine.

"Canning 'Little Tuna' (*Euthynnus alletteratus*),"
by N. D. Jarvis, article, Food Technology, vol.
VI, no. 3, pp. 113-117, printed. Food Technol-
ogy, 119-123 West Park Avenue, Champaign, Illi-
nois, 1952. This article deals with a study
made of all stages in canning little tuna. It
covers the effect of precooking times and tem-
peratures, acid dips and acid blanches, chemical
bleaches, packing mediums, storage times and tem-
peratures, type of fill, and processing and cool-
ing on the flavor, texture, and color of canned
little tuna. Recommendations for canning are
given.

"Effects of Internal Temperature and of Oven Tem-
perature on the Cooking Losses and the Palata-
bility of Baked Salmon Steaks," by Helen Charley,
article, Food Research, vol. 17, no. 2 (March-
April 1952), pp. 136-143, printed, single copies
of issue \$1.00 domestic, \$1.15 foreign. Food
Research, 119-123 W. Park Ave., Champaign, Ill.
Salmon steaks were baked to an internal tem-
perature of 167° F. (75° C.) at oven tempera-
tures varying from 350° F. (177° C.) to 500° F. (260°
C.) and at an oven temperature of 400° F. (204°
C.) to internal temperatures varying from 158° F.
(70° C.) to 185° F. (85° C.). Raising the bak-
ing temperature from 350° F. to 400° F. shorten-
ed the baking time more than did increasing the
baking temperature from 400° F. to 500° F. High-
er drip losses and excessive spattering occurred
when steaks were baked at 500° F. Considerable

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spattering occurred at 450° F. Oven temperature had no effect on the palatability scores of the baked salmon steaks. Increasing the internal temperatures from 176° F. to 185° F. prolonged the cooking period more and caused greater evaporation and total cooking losses than did a comparable rise in temperature above 158° F. or above 167° F. Steaks baked to 185° F. were ranked higher in flavor but lower in moistness than steaks baked to either 158° F. or 167° F. Steaks baked to 188° F. ranked lower in flavor and in over-all desirability than the other three treatments and were judged underdone. The judges found no differences in the palatability of steaks baked to 167° F. and those baked to 176° F. The last steak out of the oven, regardless of internal temperature, was rated higher in flavor and in desirability than steaks from the other 3 treatments.

Fish and Nutrition, by M. Rahimullah Qureshi, 4 p., printed. (Reprinted from the Pakistan Medical Journal, July 1951.) Central Fisheries Department, Karachi, Pakistan. Gives a comparative account of the consumption of fish in some of the countries of the world, and shows the comparative food value of some of the English fishes. An analysis of the food value of some of the fresh-water fish found in East and West Pakistan is also given.

The Food of Albacore (GERMO ALALUNGA) off California and Baja California, by J. L. McHugh (Bulletin of the Scripps Institution of Oceanography of the University of California, La Jolla, California, vol. 6, no. 4, pp. 161-172), 15 p., illus., printed, 25 cents. University of California Press, Berkeley, Calif., 1952. A study of the albacore (Germo alalunga) food is presented in this report. The fish were caught off California and Baja California. Examination of the stomach contents of 321 albacore indicated that the species feed on a wide variety of organisms that are mostly of small size. Fishes are dominant in the diet and the Pacific saury (Cololabis saira) is the most important species. As a group, squids constitute the most important invertebrate food. Included are discussions on food organisms, latitudinal variation, annual and seasonal variation, comparison with other food studies, and inferences on feeding habits.

The Herring, Alewife and Shad, by L. R. Day, Circular, General Series No. 19, 4 p., illus., processed. Fisheries Research Board of Canada, Atlantic Biological Station, St. Andrews, N. B., December 1951. This is a short account of the distribution, life history, and economic importance of the Atlantic herring (Clupea harengus), the alewife (Pomolobus pseudoharengus), and the shad (Alosa sapidissima). It is the third in a series of circulars being prepared to show how fishes which are often confused can readily be distinguished by means of their different external features.

(India) Annual Report of the Department of Fisheries Bombay State for the Year 1950-51, 61 p., illus.,

printed. Superintendent, Government Printing and Stationery, Bombay, India, 1952. Reports on the marine fisheries, fish curing yards, fisheries schools, socio-economic work, fresh-water fisheries, and technological studies. Statistics are also included on the different varieties and quantities of fish landed in 1950-51.

(Canada) Landings of Fresh Groundfish by Offshore Vessels at Nova Scotia Ports, 1947, by W. R. Martin and F. D. McCracken, Statistical Series No. 1, 12 p., illus., processed. Fisheries Research Board of Canada, Atlantic Biological Station, St. Andrews, N. B., May 1952. This first statistical circular presents part of the data collected for the year 1947 on landings of fresh groundfish by offshore vessels at Nova Scotia ports. It is the first of a series which, when brought up to date, will be published annually. Special reference is made in this report to changes in the landings of cod during recent years. Graphs and charts are included showing the production of cod for the Canadian Atlantic coast and the long-term fluctuations in total catch and the importance of the offshore fishery. Charts are also included showing the areas from which cod landings were taken by certain dory schooners and other trawlers in 1946, 1947, and 1948. The major aim of these charts is to give an indication of the differences in grounds fished by dory schooners and other trawlers, and of the variation in their operations by season and by year.

New Jersey Fisheries Survey, Lakes and Ponds, 1950, Report Number One, 194 p., illus., and Annex of Maps, 28 p., printed, \$1.00. New Jersey Department of Conservation and Economic Development, Division of Fish and Game, State House Annex, Trenton, N. J. The following subjects are discussed in this report: lakes, fish and fishing; general discussion of lakes surveyed during the 1950 fisheries survey; management of New Jersey lakes; parasites and diseases of fish; scale analysis; and weed control in lakes and ponds. This report also includes an annex of maps of the lakes surveyed.

"Observations on the Occurrence of Tunas in the Eastern and Central Pacific," by H. C. Godsell and E. C. Greenwood, article, California Fish and Game, April 1952, vol. 38, no. 2, pp. 239-49, illus., printed. Department of Fish and Game, San Francisco, Calif. This is a report of an investigation made in 1948 by the California Department of Fish and Game's research vessel N. B. Scofield. The area investigated was primarily the Hawaiian chain of islands and banks, and the north Pacific lying between these islands and the American mainland. Data on the distribution and abundance of yellowfin, skipjack, and albacore tuna are included.

Operation of the Trade Agreements Program—Fourth Report (July 1950-June 1951), 278 p., processed. United States Tariff Commission, Washington 25, D. C., 1952. This is the fourth report of the

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Tariff Commission on the operation of the trade agreements program. Executive Orders required the Commission to submit to the President and to the Congress at least once each year a factual report of this subject. This present report, which discusses the operation of the trade agreements program from July 1950 through June 1951, covers much the same range of subjects as the previous reports. Among other things, it describes the multilateral negotiations held by the Contracting Parties to the General Agreement at Torquay, England, from September 1950 to April 1951, and gives a preliminary general analysis of the concessions that the United States there granted and obtained. The report discusses the United States trade agreements legislation of 1951; developments respecting the general provisions of the General Agreement on Tariffs and Trade (GATT); tariffs, quantitative import restrictions, and subsidies employed by contracting parties to GATT; tariffs, quantitative import restrictions, and exchange controls employed by countries with which the United States has bilateral trade agreements; and United States measures relating to imports of trade-agreement items.

(Pakistan) Marketing and Cold Storage Facilities for Fish in Pakistan, by M. R. Qureshi and Shaikh A. Jaleel, Investigation Report No. 2, 38 p., processed. (Reprinted from Co-operation & Marketing Review, vol. 5, no. 4, October 1951.) Ministry of Food & Agriculture, Government of Pakistan, Karachi, Pakistan. This report gives the number of fishermen and annual fish landings in Pakistan, and discusses distribution, marketing, and cold-storage facilities.

(Pakistan) A Preliminary Report on Trawling in Pakistan, by M. Rahimullah Qureshi and Masood Ahmed Burney, Investigation Report No. 1, 54 p., processed. Ministry of Food & Agriculture, Central Fisheries Department, Karachi, Pakistan. This is a short account of the trawling experiments in tropical waters. "The experiments show that trawling cannot be made a commercial success unless the shore installations are organized and proper arrangements made for the reduction of small and other non-edible fish into fish meal," the authors state. A list of the local, English, and scientific names of fish taken by other trawls is included.

(Pakistan) Prospects of Marine Fisheries of Western Pakistan, by M. Rahimullah Qureshi, 10 p., printed. (Reprinted from The Bulletin of the Karachi Geographical Society, 2nd Issue 1950.) Central Fisheries Department, Government of Pakistan, Karachi, Pakistan. This paper evaluates the conditions of marine fisheries of Western Pakistan and suggests a plan for their development. Among the subjects covered are the types of fish found on the coast of Western Pakistan, total landings, boats and gear, and the fishing seasons.

(Pakistan) Trout in Pakistan, by M. Rahimullah Qureshi, 3 p., printed. (Reprinted from The Pakistan Journal of Forestry, vol. 1, no. 3, July 1951, pp. 244-46.) Central Fisheries Department,

Government of Pakistan, Karachi, Pakistan. Describes the introduction of trout in India, natural spawning, and artificial hatching.

A Racial Study of the Pacific Mackerel (PNEUMATOPHORUS DIEGO), by Phil M. Roedel, Fish Bulletin No. 84, 57 p., illus., printed. Bureau of Marine Fisheries, Department of Fish and Game, San Francisco, Calif., 1952. This is a report of a racial study made to determine whether the Pacific mackerel (*Pneumatophorus diego*), taken in different regions along the coast from Alaska into the Gulf of California, formed physically distinguishable groups. Four physical characteristics were selected for detailed study. Three related to the initial position of vertebral structures: the haemal arch, the haemal brace either single or paired, and the paired haemal brace; the fourth to the head length relative to fork length. According to the author, the commercial catch in recent seasons has been dependent largely on fish one to three years old and the fish do not mature until their second or third year. The future of the fishery is, consequently, not bright, and the magnitude of the catch is and probably will remain a function of spawning success from year to year.

"Recent Changes in Purse Seine Gear in California," by Anita E. Daugherty, article, California Fish and Game, January 1952, vol. 38, no. 1, pp. 125-131, illus., printed. Department of Fish and Game, San Francisco, Calif. This article is based on personal observations by the author in the San Pedro, California, region from October 1942 onward, and from information supplied by fishermen and others connected with the industry. It is an attempt to put on record the most important changes in seine fishing gear or seiner equipment in the last 10 or 15 years. The date of first use of each of these features, rate of spread, and present status in the fishery is given. It contains discussions on boat and net types, net preservation, corks, cork purse line, steel cable purse lines, chain lead lines, brine tanks, dragger winches, and other devices, as well as the use of depth sounders, radar, and radio-telephones by vessels using purse seines.

"A Review of the Pacific Mackerel (*Pneumatophorus diego*) Fishery of the Los Angeles Region with Special Reference to the Years 1939-1951," by Phil M. Roedel, article, California Fish and Game, April 1952, vol. 38, no. 2, pp. 253-73, illus., printed. Department of Fish and Game, San Francisco, Calif. This article reviews the Los Angeles Pacific mackerel (*Pneumatophorus diego*) fishery over the period 1928-51, with special emphasis on the years since 1938. It describes the fishing ports, fishing methods, prices paid by the cannery to the fishermen, fishing season, the seine fishery, the scoop fishery, and fishing grounds. Statistical data are also given on annual landings of Pacific mackerel, trends of the total catch, and within-season trends. The author states that "Although Pacific mackerel were canned on an experimental basis as early as 1904, it was not until 1928

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that the present-day industry got its start. The first few years were fraught with economic troubles but since 1933 the fishery has been one of major importance in California."

"The Scottish Seaweed Research Association," by F. N. Woodward, article, *Journal of the Marine Biological Association of the United Kingdom*, vol. XXIX, no. 3, pp. 719-25, printed, 22s.6d. net (US\$3.15). Cambridge University Press, London, England, 1951. This is a report on the Scottish Seaweed Research Association which was formed in 1944 at the instigation of the Scottish Council on Industry, the Ministry of Supply, the Scottish Office, the Department of Scientific and Industrial Research, the Marine Stations, and semi-official and independent organizations interested in seaweed utilization, to provide the basic information on which it was hoped that non-governmental interests could build up an industry based on Scottish seaweed, primarily with a view to bringing useful employment to the crofter population of the Scottish Highlands and Islands. The Association's research and development programs are described in this report. A list of publications so far issued or submitted for publication under the auspices of the Scottish Seaweed Research Association is also included.

Strength for the Long Run (Fifth Quarterly Report to the President by the Director of Defense Mobilization), 52 p., illus., printed, 35 cents. Office of Defense Mobilization, Washington, D. C., April 1, 1952. (For sale by the Superintendent of Documents, Washington 25, D. C.). This is the fifth quarterly report on the defense mobilization program of the United States. It covers the work of all of the defense agencies and places emphasis on the long-range aspects of defense mobilization, particularly those related to the planning and development of the productive base that would be required for full mobilization. Included are discussions on the mobilization pattern, military production, industrial expansion, materials (supplies and allocations), agriculture, manpower, economic stabilization, the defense mobilization alliance, and protecting our people and production.

TRADE LISTS

The Commercial Intelligence Branch, Office of International Trade, U. S. Department of Commerce, has published the following mimeographed trade list. Copies of this list may be obtained by firms in the United States from that Office or from Department of Commerce field offices at \$1.00 per list.

Commercial Fishing Companies and Fish Exporters-Venezuela, 2 p. (April 1952). Lists the names and addresses of Commercial fishing companies and fish exporters in Venezuela. The size of the firms listed is indicated, as well as the type of business each firm conducts.

United States Exports of Domestic and Foreign Merchandise (Commodity by Country of Destination), Calendar Year 1951, Report FT 410, Part 1, 141 p.,

processed, 25 cents. Bureau of the Census, U. S. Department of Commerce, Washington 25, D. C., April 1952. (For sale by U. S. Department of Commerce at Washington, its field offices, or the Superintendent of Documents, Washington 25, D. C.) This publication contains a compilation of United States exports of all commodities included in Groups 00 through 5. Included are edible fishery products by commodity. The statistics give quantity, value, and country to which shipped.

United States Imports of Merchandise for Consumption (Commodity by Country of Origin), Calendar Year 1951, Report No. FT 110, 180 p., processed, 70 cents. Bureau of the Census, U. S. Department of Commerce, Washington 25, D. C., April 1952. (For sale by U. S. Department of Commerce at Washington, its field offices, or the Superintendent of Documents, Washington 25, D. C.) This publication contains a compilation of United States imports of all merchandise for consumption (including fishery products, byproducts, and related products). The statistics by commodity give quantity, value, and country of origin.

The Value of North Carolina's Game and Fish, by Howard J. Stains and Frederick S. Barkalow, Jr., 33 p., illus., printed. Game Division, North Carolina Wildlife Resources Commission, Raleigh, N. C., October 1951. This bulletin is the result of a joint survey undertaken by the North Carolina Wildlife Resources Commission, the North Carolina Institute of Statistics, and the Division of Biological Sciences, North Carolina State College of Agriculture and Engineering, to supply factual information on the value of game and fish to the State of North Carolina. It provides an impartial basis for evaluating the part which game and fish play in North Carolina's economy. Discusses the aesthetic, recreational, and economic values. A table lists the dollars received by all types of businesses in North Carolina dependent on hunting and fishing. Commercial fishermen are listed as receiving \$5,495,300. The survey procedures and techniques are also presented.

(Virginia) Fifty-second and Fifty-third Annual Reports of the Commission of Fisheries of Virginia (Fiscal Years Ending June 30, 1950 and June 30, 1951), 35 p., printed. Commission of Fisheries, Newport News, Va., 1951. Describes the oyster, crab and fishery industries of Virginia and gives statistical data on the number of bushels of oyster shells planted by the Commission of Fisheries in its repletion program. Includes reports of the Superintendent of Hatcheries covering the shad-hatching work on the Chickahominy, Mattaponi, and Pamunkey Rivers for 1950 and 1951. A report from the Virginia Fisheries Laboratory describes its activities for the period July 1949 through June 1951, with special reference to the oyster, blue crab, croaker, and shad research studies. This report also shows the revenue derived from the fish and shellfish industries under supervision of the Commission of Fisheries of Virginia and also the expenditures of the Commission.

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 Editorial Assistant--Ruth V. Keefe

Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Betty Coakley, Irene Mainster

* * * * *

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HOW TO COOK OCEAN PERCH

The latest (No. 6) in the U. S. Fish and Wildlife Service's Test Kitchen Series--How to Cook Ocean Perch--contains 24 kitchen-tested recipes. Fish wholesalers and retailers, aside from improving their own knowledge of ocean perch (rosefish) cookery, will find this illustrated booklet a valuable sales aid. Use of the recipes in advertising material can boost sales of this inexpensive, delicately-flavored fish. Recipes and other material in this booklet may be reproduced freely and without restriction.

Ocean perch (rosefish) is caught by New England fishermen from Cape Cod to Nova Scotia. Although long familiar to fishermen, this fish was practically unknown to consumers in 1935. At that time the industry began experimenting with filleting and freezing ocean perch. It was found well



adapted to this method of preparation, and hence suitable for shipping to inland markets. In a comparatively few years, ocean perch (rosefish) has risen from a place of insignificance to rank fifth among all United States fish and shellfish in volume of catch. On the Pacific Coast, a species of fish called Pacific ocean perch is now being produced in expanding volume. Thus, ocean perch may well become an even more important fish in the future.

How to Cook Ocean Perch is available individually or in quantity. Single copies, 10 cents. Quantity orders for 100 copies or more sent to one address are allowed a 25 percent discount from the single-copy price. Order directly from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

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